

THE IRON AGE

THURSDAY, NOVEMBER 28, 1889.

Preventing Waste of Heat in the Steam-Engine.

In the operation of the steam-engine experiment and observation show that the great losses of heat, steam and fuel which distinguish the real from the ideal engine and which constitute the great part of the discrepancy between the computed thermodynamic efficiency and the efficiency of the engine in actual working are due to waste of heat internally by the alternate absorption of heat by the metallic surfaces of the cylinder-heads and piston and the ejection of that heat later to the condenser, if it be a condensing-engine, or in non-condensing-engines to the atmosphere. Many attempts have been made to reduce this loss by rendering the internal surfaces less perfect conductors and absorbers of heat by super-

the surface so exposed and leave the carbon in a somewhat compact form, which is held in place by a honey-combed mass of unoxidized iron. This mixture covers the surface of the solid iron to a depth depending upon the duration of the action of the oxidizing medium.

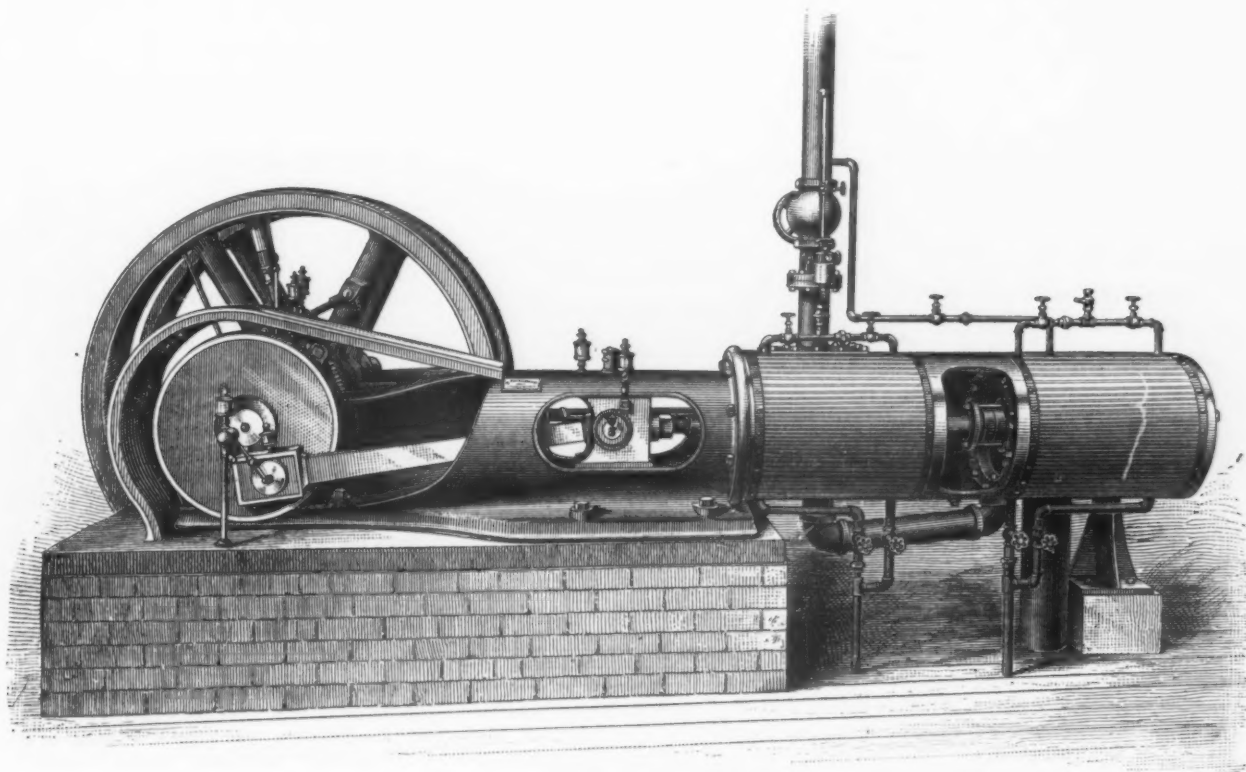
"One of the best methods of securing the oxidation of the iron is to subject it to a dilute acid—say, for example, a solution of sulphuric acid in water in the proportion of 1 part of acid to 10 of water. A weaker solution and a longer exposure would accomplish the same result. By actual experiment I have found that a piece of iron submitted to a very weak solution of acid for ten days produced good results.

"In carrying out my invention I expose the internal parts of the engine (such as the heads of the cylinder, the two sides of

other adhesive non-conducting materials—which will increase the non-conducting and heat-storing properties of the surfaces, and at the same time aid in giving them permanence in the presence of variations of temperature, pressure and humidity, such as inevitably occur within the engine."

Tandem Compound Engine.

The engine of which we herewith present engravings is a tandem compound, in which the high-pressure cylinder is placed next to the frame. The arrangement is such that the piston and rear head of the high-pressure cylinder, together with the front head of the low-pressure cylinder, can be drawn back through the low-pressure cylinder. This construction permits both pistons to be taken out through the low-pressure



TANDEM COMPOUND ENGINE, BUILT BY B. W. PAYNE & SONS.

heating the entire steam and by "compounding" the engine. The steam-jacket has also been employed and the internal surfaces have been covered with non-conductors of heat by various inventors; but no device of this kind yet introduced or tested experimentally has been efficient.

The object of an invention recently patented by Prof. R. H. Thurston, of Cornell University, is to provide an effective non-conducting surface for the internal surfaces of the steam-engine cylinder, formed integrally with the castings of which the engine is composed. The specifications explain how this is accomplished in the following words: "It is well known that the composition of ordinary cast-iron is largely graphitic, the carbon contained by the iron amounting to from 2 to 3 per cent. of the whole up to 5 or 6 per cent., according as the iron has been exposed to a higher or lower temperature in the blast-furnace and as a greater or less amount of fuel is burned in its reduction from the ore. It is also well known that a process of slow oxidation will remove the iron in part from

the piston, the internal surfaces of the ports and the clearance space) to the action of such a solvent for a suitable length of time, thus converting those surfaces into highly-carbonized material, which is a poor conductor of heat. It is, of course, impracticable to so treat the rubbing-surfaces; but as they are kept in a high state of polish their capacity for taking up heat is greatly lessened, and it is therefore less necessary to treat the surfaces subjected to friction.

"In modern engines, especially those of a 'high-speed' type, the cylinders are of large diameter and small length and the stroke of the piston is short, thus exposing large areas, which are effective in condensing the steam and reducing the efficiency of the engine. These large areas I propose to treat in the manner described to prevent the wasting of heat.

"In some cases, in addition to rendering the surfaces graphitic in the manner described, I shall fill the spongy surfaces so prepared with a substance which is a non-conductor of heat—such as oil, shellac or

cylinder without disconnecting the rear cylinder or yoke. The high-pressure valve works between the valve-seat and a pressure-plate, as shown in the right-hand view in Fig. 2, and is practically pressureless. As both the valve and pressure-plate have inclined surfaces they are self-adjusting and always keep tight. By reason of the valve being so entirely relieved of pressure, the extreme high-steam pressures so desirable in point of economy are permissible. The high and low pressure valves are actuated by independent eccentrics; that moving the high-pressure valve being controlled by the governor, while that of the low-pressure valve is fixed. The governor shown in the drawing, Fig. 5, is one of the many types controlling a shifting eccentric, arranged so that the engine may be reversed if desired. The engine is very heavy in all its parts and is designed for the severest duty under the highest pressures. The cylinders are 9½ x 16 inches and the stroke is 15 inches. The engine is built by B. W. Payne & Sons, of Elmira, N. Y.

The Largest Gear-Wheel.

The Dickson Mfg. Company have two shops in Scranton. At the Penn avenue shops a large amount of work is being

single casting weighing 16 tons for a hydraulic riveting-machine.

The other shops of this company, locally known as the Cliff Works, are devoted entirely to the building of locomotives and

pany, and five passenger-engines, anthracite coal-burners, for the same company. There are also in progress 15 consolidation engines of very large size for the Delaware, Lackawanna and Western Railroad. These engines have 20 x 24 inch cylinders; the boilers are 58 inches in diameter of barrel and have fire-boxes designed for burning culm. The use of this fire-box, indeed, is extending very widely in the coal regions. Those on the engines in question are similar in general design to the Wootten fire-box, but have not the combustion-chamber. A noticeable feature of these engines is not only the size of the boilers, but the fact that they are placed very high, the center of the boiler being at a height above the track which would have been

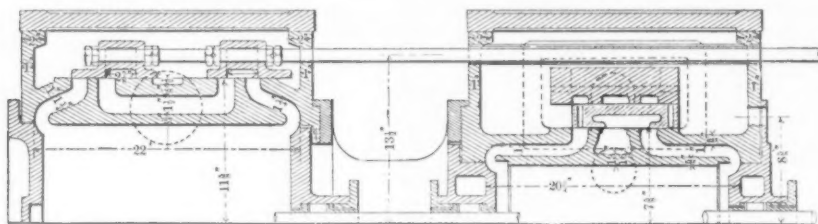


Fig. 2.—Longitudinal Section through Valves.

done on general machinery, and on the floor of the main shop, which is arranged to take in work of almost any size, there is a great variety of large machinery in process of erection, including two 60-inch cylinders for a blowing-engine and other work of this class. The most striking object, however, is an enormous wheel for the Calumet and Hecla Company, which is probably the largest gear-wheel ever built. This is a sand-wheel, as it is called, intended to pump up tailings from the stamp-mills, which cannot be handled with an ordinary pump owing to the large proportion of sand to the water. The wheel is 50 feet in diameter on the face and 54 feet outside the teeth, and will carry 448 steel buckets and will have a lifting ca-

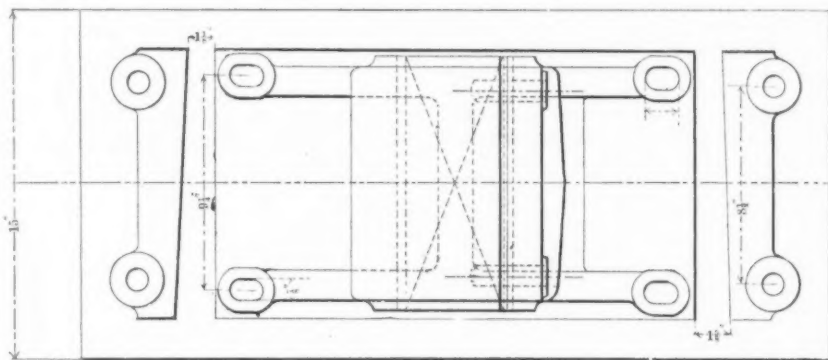


Fig. 3.—Plan of Bearing.

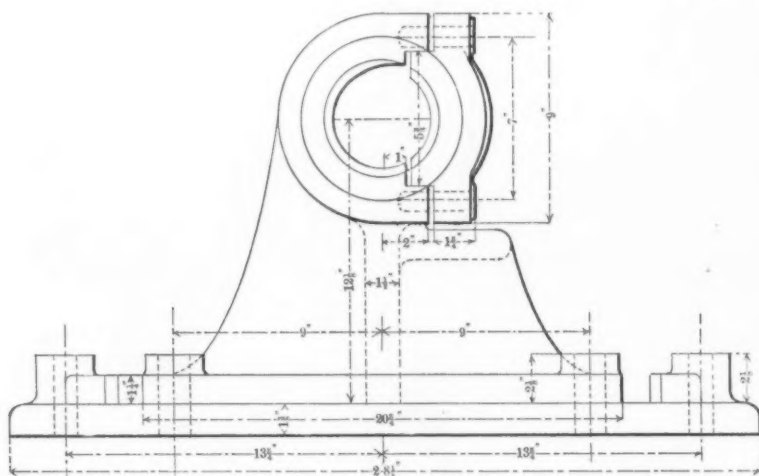


Fig. 4.—Vertical Section of Bearing.

capacity of 3,000,000 gallons of water and 2000 tons of sand in 24 hours. The rim of the wheel is made of plates and angle-irons riveted together, and its general construction resembles that of a bicycle-wheel, the connection between the rim and the hub being made by steel straining-rods $3\frac{1}{2}$ inches in diameter. There are 18 of these rods and they are all in tension. The teeth are in segments bolted to the rim. The total number of teeth is 432; they are 4.70 inches pitch and 18 inches on the face and have all been cut by a special machine designed by Mr. Broadbent, superintendent of the shop. The shaft on which this wheel runs has journals 22 inches in diameter and 40 inches long, and between the journals is 30 inches in diameter. The great wheel will be driven by a pinion having 33 teeth of corresponding pitch and face.

Among other work in the shops are several large cranes for foundry and other purposes. A very neat design for a foundry crane is run by a three-cylinder Brotherhood engine, and is not only compact and powerful, but avoids the heavy strain usually thrown upon the turning-post. In the foundry some very large castings have recently been made, including some 90-inch cylinders for marine engines and a

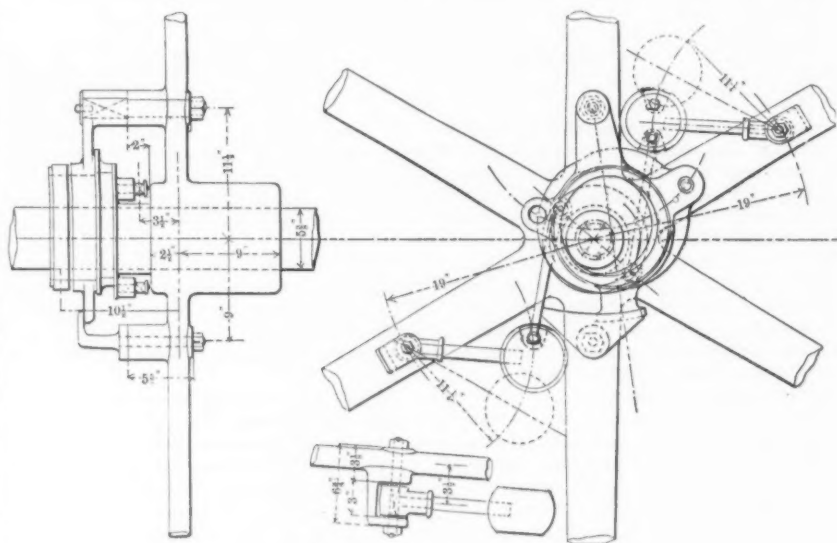


Fig. 5.—The Governor.

are at present very full of work. The orders now on the floor include 15 consolidation engines, with Wootten boilers, for the Delaware and Hudson Canal Com-

pany, and five passenger-engines, anthracite coal-burners, for the same company. These earnings are shown after paying for new machinery in nearly all the mills.

MECHANICAL ENGINEERS.

NEW YORK MEETING.

(Concluded.)

The first business transacted at the Thursday session was the consideration of the report of the committee appointed at the Erie meeting to take under consideration the subject of a governmental bureau for the record of standards. The committee consisted of James W. See, Coleman Sellers and Oberlin Smith, and was the outcome of a paper showing the lack and the need of recognized standards presented at the Erie meeting by Mr. See. The resolutions presented were as follows:

STANDARDS.

Resolved by the American Society of Mechanical Engineers:

1. That a committee of three be appointed by the president, such committee to be known as the Committee on Standards.

2. That when, from any reason, vacancies arise in such committee, the president shall, on notice thereof, fill such vacancy by appointment under the rules.

3. That it shall be the duty of such Committee on Standards to use all reasonable efforts to secure such Congressional legislation as will provide a governmental bureau of record wherein may be entered respectably recognized and approved standards for the promotion of uniformity in the products of the arts, in technical customs and in nomenclature.

4. That in the event of such legislation being secured and such bureau provided for, it shall become the duty of such Committee on Standards to file, on behalf of this society, applications for the entry of such standards as the society may hereafter from time to time approve.

5. That properly certified bills for postage, stationery and other expenses incurred by such Committee on Standards in their efforts to procure the Congressional legislation herein looked to be paid out of the funds of the society, in amount limited at discretion of Council.

Resolved by the American Society of Mechanical Engineers, having more than 1000 members engaged in the manufacturing industries of the country and in allied professional pursuits:

1. The time has arrived when practical standards of uniformity based on a common understanding are essential to industrial business and professional pursuits.

2. A large number of practical standards of respectable recognition and approval are now in use but without authentic record.

3. Systematic procedures in the matter of recording such approved standards would tend toward the inauguration of many other greatly needed standards, tending toward uniformity and interchangeability of merchantable products, in improved codes and signals and in scientific nomenclature.

4. Provision should be made, under governmental auspices, for a place of record for standards having respectable recognition or approval regarding their fitness for such record.

It was finally resolved to embody the foregoing in a preamble to the act to be presented for the consideration of Congress. The act provides that proper and clearly defined standards of dimension, form, capacity, composition, symbolism, equivalency, definition, test, grade, designation or mode of procedure may be entered in the Patent Office. That each application for the entry of a standard must show the approval of an organized

association of individuals respectably representative of some calling concerned with such standard, or the head of some department of government, or the Chancellor of the Smithsonian Institution. It must be filed by a committee on standards consisting of not more than three members to be accredited by the approving society and to be empowered to prosecute the application to final decision by the Patent Office. It must be accompanied by specifications and drawings, model or sample, as which may be requisite. The cost to be \$15. Provision is made for the prosecution of the application before the Commissioner of Patents, and upon approval it shall be printed in the Official Gazette. The standard shall be captioned "United States Standard" and shall be given a title, a serial number and a date of issue, and shall designate the society or government officer empowering the application for the entry. The Commissioner shall furnish copies upon request and upon payment of the cost and shall permit comparisons and copies to be made, to which he shall certify upon the payment of a proper fee. No standard shall be canceled or corrected, but others may be entered *de novo*. The object of the act is to facilitate commerce between the States by furnishing a repository for entries of approved standards, and nothing contained in the act shall of itself be taken to bind any person to conform to any entered standard.

In the discussion that followed the presentation of the resolutions the action was objected to, since it had never been the policy of the society to commit itself to any standard, as was illustrated in the boiler test and pipe-thread standards. It will establish a precedent through which the society, as a society, will receive nothing, but will approve, through its committee, certain standards and permit the publication of the reports in its proceedings.

Professor Sellers dwelt upon the imperative need of standards—standards of such a nature that they would not only be adopted in this country but would also be adopted in England. He explained that by the provisions of the act any society if of recognized standing was privileged to register a standard, but no society was committed to any standard so registered, nor was any attempt made by the act, or the position of the society making the application, to force the adoption of any standard.

President Towne, having surrendered the chair, presented a resolution intended to take the initiative toward the formation of a

NATIONAL ORGANIZATION OF ENGINEERS, to be composed of members of the Mechanical, Civil, Mining and Electrical societies. This would enlarge the field, would result in better work and would more widely and generally diffuse the results than is now possible with four societies. While accomplishing more good it would in no way interfere with or diminish the individuality and usefulness of the societies now existing. This is illustrated in the case of the Institution of Civil Engineers of England, who take their membership not only from civil engineering, but from every branch of engineering. Although that society is prosperous in every way, there are flourishing smaller

societies composed of men devoted to one of the divisions of engineering. Both follow certain paths and attain results neither could alone. A similar union in this country would reach equally good results. The resolution provided for the appointing by the council of a committee of three to confer with a similar committee to be appointed by each of the other societies and ascertain the feeling regarding the feasibility and practicability of such an organization. The first paper presented was that by Fred. W. Parsons, on

INDICATOR-RIGGING FOR COMPOUND ENGINES.

It is sometimes interesting as well as instructive to combine the diagrams taken from the two cylinders of a compound engine. In order that the horizontal scale of measurements shall be the same it is obviously necessary to reduce the high-pressure diagram to a length bearing the same proportion to the low-pressure diagram as the volume of the high-pressure cylinder is to that of the low-pressure cylinder. The device described is an ordinary form of indicator-rigging with two segments. The radius of the large segment is dependent upon the length desired for the low-pressure diagram. The radius of the small segment is in the same proportion to the radius of the large segment as the volume of the high-pressure cylinder is to the volume of the low-pressure cylinder. The diagram may be taken with separate indicators upon the high and low pressure cylinders and afterward traced upon the same paper, or by piping the high and low pressure cylinders together with a three-way cock between both diagrams may be taken on the same paper. By using three and four segments this device can be used for reducing the diagrams from triple and quadruple expansion engines.

A NEW RECORDING PRESSURE-GAUGE

was described and illustrated by W. H. Bristol. The object in designing the gauge was to produce an instrument that would be fundamentally simple and consequently reliable and which could be made at a moderate cost. The pressure-tube is of flattened cross-section and is bent into approximately a sinusoidal form. A flexible strip of the same metal as the tube is secured at the ends and along the bands. The bent tube may be considered as a series of Bourdon springs placed end to end. Pressure applied to the tube produces a tendency to straighten each bend, or collectively to elongate the whole. This tendency to lengthen the tube is resisted by the flexible strip and thereby converted into a multiplied lateral motion. The inking-pointer is attached directly to the end of the pressure-tube and the usual mechanism and multiplying devices are dispensed with, since the motion of the tube itself is positive and of sufficient range. The special advantage of this is evident, considering that in all other pressure-gauges the movement of the tube or diaphragm is small and requires a system of mechanism to multiply the motion many times before it is available for indicating purposes. These multiplying devices must be delicately constructed and properly cared for, and even under the most favorable conditions they are liable at any moment to be a source of error. The printed charts for receiving the record make one revolution in 24 hours and are provided with radial arcs and concentric circles, the divisions on the arcs corresponding to differences in pressure, while those on the circles correspond to hours. The instrument is adapted for a vacuum as well as for a pressure gauge and may be made sufficiently sensitive to serve as a barometer. With the tube filled with a very expansible liquid, such as alcohol, it may be used as a recording thermometer.

In the discussion of this paper Mr. Hague stated that the recording pressure-gauge was an exceedingly necessary instrument, and that no water or steam plant could be perfectly run without it.

Mr. Edson stated that the increased travel of the pointer was in some cases very necessary, but why the particular instrument described should not make false indications, or in other words should be absolutely accurate in its results, he did not clearly perceive. It was one thing to see a record made by a recording gauge on a piece of paper, but it was an extremely difficult matter to ascertain correctly the accuracy of the instrument. It should resile quickly. He had noticed that in the thermometer adaptation of the instrument shown to the members it resiled slowly, even when brought under the influence of the heat of the argand burner, and also when plunged into the iced bath. The difference in temperature here brought to bear upon the instrument was extreme, and it should have marked the results more quickly. In addition, he preferred a pencil point to an ink point, and thought that the recording-arm should have sufficient power to overcome the friction created by the pencil.

Mr. Bristol stated in explanation of this that the instrument was quickly sensitive and that it had been used successfully on the plant at the Stevens Institute for many months and had always given satisfaction.

Mr. Wolff said that the greatest use of the recording-gauge was to put a check on the engineer, and that its usefulness depended upon its accuracy, which should be perfect.

Prof. D. S. Jacobus presented a paper on
THE SOLUTION OF THE TRANSMISSION OF FORCES,

and endeavored to present a set of equations involving every condition met with in any ordinary engine practice, not intended for every-day use, but valuable as showing that the more approximate ones are sufficiently accurate for ordinary purposes. The accelerating forces must necessarily be used in determining the following quantities:

1. The pressures that exist in the bearings.
2. The effort transmitted to the crank at each point of its revolution, knowing which the fluctuation of energy can be determined.
3. The forces tending to shake the bed of the engine.

Covering these general and approximate equations have been applied to four classes of engines and the difference in the results determined. The results are tabulated and conclusions drawn. In making use of the shaking forces in order to determine the proper size of counter-weight a very complex problem is presented. In the article it is not attempted to show anything further than the magnitude and direction of these forces in a given engine for different sizes of counter-weight. The simplified problem of determining the movement of an engine supposed to be suspended in space has been worked out by the author of the paper and will shortly be published; but this is, of course, not the condition of an engine set in the ordinary way. The paper deals with these points from the mathematical point of view, and the results reached are exceedingly valuable to those who can follow and appreciate the reasoning of the writer.

In the discussion Professor Denton asked what difference does it make if we take any account of the acceleration of forces or not? In the first Porter engine at high speed it was claimed that all pressure on the crank-pin had been annihilated. Whether heavy or light pistons have anything to do with smooth running or not is

open; yet it is established that every reciprocating part causes wear. The Professor instanced the case of a single engine in which one of the ports had been closed. The result was that the pin on the fly-wheel was nearly sheared off; yet there was no outside evidence of inside disturbance. The difference in harmony of two engines which were coupled to make a compound also resulted in the shearing of the pin. It is not possible to put any weight into the crank that will counterbalance all the reciprocating forces. One of the members stated that he had followed the practice of counterbalancing the horizontal accelerating forces in a horizontal engine and letting the vertical go.

A paper by S. J. Macfarren dealt with

STREET CAR GEAR FOR MODERATE SPEEDS.

The writer said that during his residence in an interior Mexican State a native street railway company were organized and a road built having 3 feet gauge. The cars which came for use upon the road bore the appearance of having been hastily altered from a wide gauge by the simple means of pressing the wheels closer together on the axles without moving in the sills or journal-boxes of the car. This method left some 10 inches clear axles outside of the wheel-hub at each end and between that support and the bearing which was to carry the load. The writer's suggestion to cut off the axles and leave the sills and journals in to correspond with the narrow gauge was met with a child-like trust in the manufacturing house and the expressed fear of lessening the stability of the cars by thus narrowing their support. These axles cranked to a permanent set on the first ensuing holiday, and a sorry lot of wheeled imitations of crippled cattle are to this day sustaining the reputation of that manufacturer in that vicinity. The present increase in street-railway construction has also increased the percentage of uninformed buyers and made a harvest for all classes of builders of street cars. We find that street-car gears are not generally made by the concerns building the cars. The author considered the principal points entering into the question of the coming self-propelled car, dealing with the road-bed and construction of the car itself.

THE COMPARISON OF INDICATORS

was considered by Prof. J. Burkitt Webb. The indicator may be used for three things: 1, to obtain the area of the true card as representing work done per stroke; 2, to obtain the pressure on some particular point of the stroke, and, 3, to obtain the shape of the true card as indicating the condition and action of the steam and various parts of the engine. There are also various features in the construction of the indicator which must be carefully examined and compared before a correct judgment of the merits of the instrument can be made. The following features of construction will affect the accuracy of the indicator in one or more of the points above mentioned. 1. Uniformity of the spring. 2. Parallelism of the piston movement to the cylinder. 3. Uniformity of the pencil movement. 4. Parallelism of the pencil movement to the drum-axis. 5. Accuracy of the drum motion. 6. Phase of the drum motion. 7. Mass of the parts and its distribution, and the strength of the spring. 8. Friction of the piston and pencil movements. 9. Lost motion.

Each of these points was taken up in order, and with the aid of the engravings the most common defects and the possible remedies were dwelt upon.

Prof. J. E. Denton recently made exhaustive tests on the well-known Pawtucket pumping-engine, which he embodied in a paper entitled

STEAM-JACKETS ON THE PAWTUCKET PUMP-ING-ENGINE.

The jackets of this engine enveloped the heads and barrels of both cylinders and steam at full boiler pressure is used in each. The condensed steam from the jackets is pumped into the feed-pipe at a point between the boiler and the hot-well. The condensed steam collected in the receiver is received in a trap and continuously pumped through a heater placed in the chimney-flue and thence around to the top of the receiver. Out of a total of 155 pounds thus circulated only one-third is evaporated and returned to the receiver as steam, the other two-thirds gradually accumulating in the receiver and being blown to waste every three hours. Without going into the details of the paper, we present the following conclusions which the tests appeared to have indicated: 1, that the averages of results of indicator cards taken in the most careful manner with the best modern indicators show a possible saving from the use of jackets amounting to from 0.13 to 0.35 pounds of steam per hour per horse-power, but that these amounts are within the limit of error to which the determination of indicated horse-power and cut-offs are subjected, so that, 2, The most that can be claimed for the jacket is that it probably caused no loss, and may possibly have caused a saving, not exceeding 3 per cent. of the total steam consumption.

In the discussion of this paper C. E. Emery stated that the difficulty with the paper was the conclusion that the saving is but 3 per cent. It runs up to 12 per cent. All the data connected with the tests should have been given in the paper in full. It is necessary in estimating the use of the jacket to know perfectly the condition of the steam and the many features which have a bearing upon the result. There is a very appreciable gain in the use of the steam-jacket.

Oberlin Smith suggested that in order to make a reliable test of an engine with and without a jacket it would be necessary to totally remove the jacket, since it is impossible to get two engines precisely alike in all their working aspects, one built without and the other with a jacket. Testing an engine with steam in the jacket and then testing without steam in the jacket will not give the full result of the economy caused by the steam jacket, since the jacket-space, even when unoccupied by steam, will serve to a certain extent the purpose aimed at in the jacket. The engine should be constructed, in order to make the test accurate and reliable, with a removable cylinder encircling the main cylinder with the proper space intervening, and it could be drawn away from the main cylinder when it was desired to test the engine without a steam-jacket. This would give the exact difference between the use of the steam-jacket in an engine and the working of the same engine without its jacket.

Mr. Wolff said that the idea of the steam-jacket was not to prevent radiation, but to supply heat units to the steam in the cylinder during expansion by the condensation of the steam in the jacket, the heat from this steam being transmitted to the steam doing work in the cylinder. The fact that the jacket is on the cylinder does not affect the results. The point of the paper was the statement that with and without the jacket the steam consumption did not vary 3 per cent. This may have resulted in variation in the card. A gain of 12 per cent. had been made in engines under different conditions and different methods of testing.

Mr. Henthorn stated that the steam-jacket on an engine similar to that at Pawtucket had resulted in an advance of from 7 to 10 per cent.—that is, the duty increased in that ratio.

Professor Webb said that the steam used in the jacket was to be considered as a loss. The flow of temperature in the steam in the jacket terminated in heat transmitted to the steam in the cylinder. While practical results indicated a saving by its use, there was no good theory for the end reached.

Professor Thurston stated that compounds by the use of steam-jackets are now running which save from 10 to 12 per cent. It is a fact that the steam-jacket is decreasing in usefulness as the engine advances toward perfection, and will be wholly useless should that point ever be reached. Under certain conditions its use may result in a decided loss. There are two periods in the steam-cylinder—the steam weeping in and out of the cylinder. The entering steam heats the surfaces and prevents initial condensation, but is hurtful at the last, as it heats the steam on its road to the condenser. The saving resulting from the use of the steam-jacket is the difference in these effects, it being taken into account that the first effect is on entering steam at a high pressure, while the final effect is on the outgoing steam at a reduced pressure due to expansion.

Professor Webb said that there is re-evaporation in the cylinder, but not in the jacket.

Mr. Towne said that the use of the steam-jacket was undoubtedly affected by the ratio of expansion.

Professor Denton in further explaining the method pursued in making the test upon which his paper was founded said that the feed-water was measured by meter, which was tested before, during and after the test. He wished to sound an alarm as to whether we know anything about the saving of the steam-jacket or not. Friction, cards and many other factors enter into the problem, each bearing a direct effect upon the results hoped for. The steam-jacket must be studied with a degree of refinement not yet attempted.

J. F. Holloway presented a paper on
HOW TO USE STEAM EXPANSIVELY IN
DIRECT-ACTING STEAM-PUMPS.

In an article presented in *The Iron Age* some time since and taken from a lecture delivered by Mr. Holloway before the class in engineering at Cornell we had the principal engravings and the main points of the text of this paper. Mr. Holloway showed that a card taken from the water-end of a direct-acting pump was practically a parallelogram, while the card from the steam-cylinder showed that at the beginning of the stroke the power was much more than sufficient to move the load, while at the end it was much less than that required. Heretofore it has been usual to overcome this difference by storing the power in a fly-wheel, but by means of the high-duty attachment of the Worthington pump this discrepancy is overcome without the use of a heavy fly-wheel. The excessive initial power in the steam-cylinder is so stored as to exert its power during the latter half of the stroke when it augments the decreasing power of the steam in the cylinder.

The remarks, rather than discussion, which followed the paper were confined mainly to expressions of warm admiration for the simplicity and effectiveness of the arrangement explained and of deep respect for the memory of the late Henry R. Worthington, who brought the direct-acting pump to such a high state of perfection and upon whose efforts the present results are founded.

The paper by C. T. Main on the

COST OF STEAM AND WATER POWER was read at the Erie meeting, held last spring. It gave the cost of water-power per horse-power at Lawrence, Lowell and Manchester and compared this with the best steam-engine results. In our report of that meeting will be found abstracts

giving the main points brought out in the paper.

GRAPHICAL ANALYSIS OF RECIPROCATING MOTION

was dealt with in a paper by Oberlin Smith, the object being to call attention to a graphical method of representing all reciprocating motions in machines which have such relations to each other that they must perform certain portions of their journeys in given times. It may be used also to represent rotary motions. It consists simply in drawing straight or curved lines, or a combination of both, which represent the successive portions of any given points in a moving member of a machine. The paper describes the use of the method and gives many illustrations showing its application. The final paper of the session was to have been presented on board the double-ended screw ferry-boat Bergen, of the Hoboken Ferry Company, but owing to an accident to the Bergen's boilers she could not be used. The paper was by Prof. James E. Denton, on the

PERFORMANCE OF A DOUBLE-SCREW FERRY-BOAT,

with an introduction by Col. E. A. Stevens. The introduction briefly outlined the use of screws for ferry service, beginning with the first propeller ferry-boat, built by the writer's grandfather, John Stevens, in the first decade of this century, and which ran from Hoboken to Barclay street, this city.

The portion of the paper by Professor Denton was in fact a comparison between the performance of the Orange, a side-wheel boat with low-pressure beam engine, and the Bergen, a double-end propeller with triple-expansion engine. We regret that we have only space for the conclusions drawn from the experiments.

1. The steam used per horse-power for all purposes is 25 pounds per hour for the beam engine and 22 pounds for the triple engine under their average conditions of ferry service, but the consumption of the Bergen's main engine is only 18.3 pounds per hour per horse-power, the direct-acting steam feed and circulating pumps, &c., consuming about 3½ pounds per indicated horse-power.

2. The steam consumption of both engines does not sensibly differ while in intermittent ferry service from that found during continuous working of the engines.

3. The economy of the drop-return-flue boiler of the Orange is practically the same as the locomotive type in the Bergen, both boilers evaporating on the average about 8½ pounds of water per pound of bituminous coal under ordinary working conditions, thus making the consumption of coal per hour per horse-power about 2.9 pounds for the beam engine, 2.6 for the Bergen for all purposes and 2.15 pounds for main engines alone.

4. The speed of the boats under all conditions is practically in agreement with the law of cubes, and by the application of this law it appears that for a still-water speed of 12.6 statute miles per hour the following statements are practically true: The paddle-wheel boat would require 642 horse-power and would make 24½ revolutions per minute, with a slip of 26 per cent. The screw boat, using double screws, would require 680 horse-power, an engine speed of 145 revolutions and the slip would be 12½ per cent. The screw boat, using one screw at the stern, would require 584 horse-power, 152 revolutions per minute, and the slip would be 18 per cent. The screw boat, using one screw at the bow, would require 692 horse-power, 163 revolutions per minute, and the slip would be 18 per cent., but the recoil upon the hull of the water which the screw acts on would make the apparent slip about 22 per cent.

5. The screw at the bow, using the same horse-power as the screw at the stern for equal revolutions, propels the boat slower than the screw at the stern by an amount practically equal to the equivalent of the extra resistance due to the increase of the velocity of the boat by an amount equal to the velocity of slip of the screw.

6. By calculations based upon the accepted relations between the slip of the screw and the velocity of a boat it appears that, in order for the double screws to produce the same speed as a single screw of the same diameter at the stern, the slip of the latter must be to the former in the ratio of 18 to 11, and therefore the cause of the extra power consumed by the two screws as compared to the one screw is the fact that the slips are as 18 to 12.6, instead of as 18 to 11. The details of this calculation are given in the body of the paper. To alter this ratio of slip the diameter of the two screws must be greater than that of the one screw.

EXCURSIONS.

Thursday evening many members attended the fair of the American Institute and for the courtesy of invitation were indebted to the Board of Managers of the Institute. Friday morning a trip was made on the steamer Laura M. Starin—on board which lunch was served by the courtesy of Dr. Henry Morton, of Stevens Institute—to Elizabethport, where the automatic machinery of the Singer Mfg. Company and the many special tools and appliances of the Babcock & Wilcox Company were inspected. Saturday morning the members visited the famous ocean racer, the City of Paris, every part of which was thrown open. It is needless to say that the 20,000 horse-power engines attracted more attention than the commodious arrangement and elegant fittings of the "living" part of the boat. For the lunch served on board the members were indebted to the owners of the boat, the Inman Company.

Advertisements have been issued from the Navy Department for proposals for furnishing steel plates for use in the construction of the United States armored battle-ship Texas, building at the Norfolk Navy Yard, to be opened at the Department, December 16, at noon. There are required about 661 tons of plates, of which 246 tons are for the lower layer of protective-deck plating and 415 tons for the upper and middle layers, the upper and lower layers of top of redoubt and the protective-side plating. Deliveries are to be made at the Norfolk yard, and are to commence 30 days and end 60 days from the date of the contract. Bids for these same plates were opened August 6 last, but it was found that the prices were too high and the proposals were all rejected. The cause of the excessive prices was that among the plates required were some that were 115 inches wide. As the largest steel rolls in the country are only 119 inches wide, the manufacture of plates of that width would be extremely difficult, and there would be danger that much of the material submitted would be rejected for irregularity at the edges. The schedule has been revised and a new plan of plating arranged to overcome this difficulty.

The Crescent Iron Works, Samuel L. Moore & Sons' Company, of Elizabethport, N. J., have applied to the Navy Department to have a commission appointed to examine their plants and report on their ability to undertake the construction of steel vessels for the Government. They are anxious to bid on the 1000-ton gun-boats and the Naval Academy practice cruiser, and they add one more to the list of firms ready to compete for naval work.

Engine-Lathe and Cutting-Off Machine.

The screw-cutting engine-lathe and the cutting-off machine of which we here present engravings are built by the Hendey Machine Company, of Torrington, Conn. The lathe has hollow spindle, compound rest, power cross-feed, belt and gear feed. It swings 21½ inches over the ways and 14½ inches over the carriage. The driving-cone has four steps from 6 to 13 inches in diameter for 3¼-inch belt. The ratio of gearing in the head-stock is 13 to 1. The spindle is 2½ inches in diameter, has a 1¼-inch hole through its entire length, and its bearings are of hard bronze and are made so they can be readily renewed when necessary. The front bearing is 3½ inches in diameter by 5½ inches long, the back bearing being 2½ inches in diameter by 4 inches long. The tail-stock is 12 inches wide by 14 inches long. The bed is 19½ inches wide, 14½ inches deep and is formed with cross-webs 4 inches wide and spaced 27 inches apart. It is

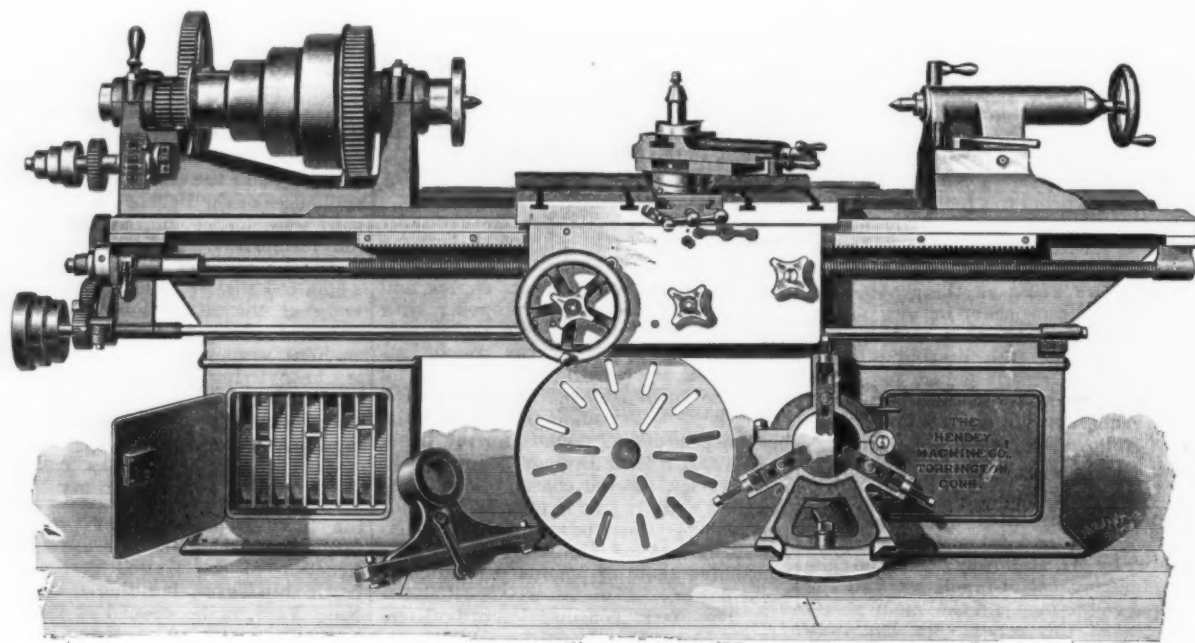
inches in diameter by 4½ inches long; the cones are 9, 11 and 13 inches for 4-inch belt. The total weight of the machine is 1400 pounds.

Heat Lost by Unprotected Steam-Pipes.

Albert Haacke, of the Kieselguhr Company, has recently fitted up an apparatus for measuring the amount of heat lost by radiation and convection from steam-pipes and the like, and has communicated the result of some of his first experiments with it to *Engineering*, together with a description of the arrangement. The tests in question were directed to determine the relative losses of heat from (1) bare pipes; (2) pipes covered with 1 inch of fossil meal composition; and (3) pipes covered with 1 inch of fossil meal composition and three layers of hair felt. The testing surfaces are represented in Mr. Haacke's arrangement by three cast-iron steam-pipes of 5 inches internal diameter and 6 feet

ducting composition applied to hot surfaces is a measure of its non-conducting efficiency. He considers this test of measuring the outside temperature, either by the hand or even by thermometer readings, as unreliable and misleading, and insists upon condensation experiments as the most reliable method of ascertaining the loss of heat by steam.

The Lima Oil Field.—The great oil field which made western Pennsylvania famous has been transferred from that State to Ohio, with Lima for its center, where the great refineries are now established. The several pipe lines now completed extend from that point both to the sea-board and the lakes. The works at Lima, report says, will be doubled in capacity, to 12,000 gallons a day. Thousands of tanks have been erected in the Lima region and filled with crude oil as soon as built, until now the Standard Oil Company have 25,000,000 barrels of crude Lima oil in their storage-reservoirs. The



SCREW-CUTTING ENGINE LATHE.

supported on two large cabinet legs, one of which is fitted to hold the change-gears. The tools and fixtures can be kept in the other cabinet. The screw is of steel, 1½ inches in diameter, and the nut is 5½ inches long. The lathe will cut threads from 2 to 18 per inch. The largest of the two face-plates is 21 inches in diameter. The machine weighs 3500 pounds.

The 2½-inch cutting-off machine is of new design and is claimed to have several points of advantage over the old style of machine, being very compact and convenient to handle. The tool-carriage has side adjustment and can be quickly set to cut off a number of short pieces without moving the bar in the chucks. The tool-post is made so as to raise and lower the tool and a gauge is provided for cutting duplicate pieces to same length. The support at back end of machine for holding up long bars has vertical adjustment for different sizes of stock and also has a roll to carry the stock easily. The receptacle for chips is drained of oil and the chips can be easily removed. The machine is provided with two good four-jawed chucks, and the one next to the cutting-tool is well up out of the way of chips. The front bearing is 4½ inches in diameter by 6 inches long; the back bearing is 4

long, with blank flanges on each end. These test-pipes are supplied with steam that has been dried, and are placed so as to be subject to radiation and convection under precisely similar conditions, one being bare, the other covered with fossil meal composition 1 inch thick, the third with 1 inch of composition and three layers of No. 3 felt, each ¼ inch in thickness.

The result of experiments with steam in the different pipes under pressures of from 45 to 60 pounds and upward goes to show that a covering of fossil meal composition 1 inch thick saves out of a possible loss of 100 per cent. as much as 83.57 per cent.; and if over this covering 1½ inches of hair felt with canvas is added the extra saving is only 8.25 per cent. If 1 pound of steam coal is required to evaporate 8 pounds of water into steam of 60 pounds pressure, then 6½ hundred-weight of steam coal are required every year to make good the loss of heat from every square foot of uncovered steam-pipe. This loss is even greater in winter or when the pipes are exposed to wind and rain, or where steam of high temperature is used. Finally, Mr. Haacke combats the opinion, which is firmly established in the minds of many users of steam, that the outside temperature of a non-con-

great storage-tanks that dotted the north-western part of Pennsylvania and the southern border of New York have been taken down and carried over into Ohio, where they have been set up in the Lima field. Over 500 of these tanks have been transferred from Alleghany County, N. Y. The most important move thus far is the extension of the Chicago pipe line eastward from Lima to McLean County, in Pennsylvania, where connection has been made with the pipe lines running to the sea-board. This connection was made one month ago, and the Standard Oil Company now have continuous pipe communication between Philadelphia and Chicago. The Standard Company can thus pump crude or refined Lima oil direct from the Ohio fields to New York, Philadelphia, Baltimore or Buffalo, or they can send Pennsylvania oil westward in the same way into Ohio or through to Chicago.

The assignment of the iron firm of Coldwell, Wilcox & Co., at Newburg, a concern who have been largely interested in the New York aqueduct contracts, is announced. The firm not long since purchased a site on the river front, adjoining lands of the Standard Oil Company, and

erected a large shop. Thomas Coldwell, father of the senior member, is made assignee. The cause of the failure is attributed to the desire of the firm to do more than their capital would allow.

Canada's New Water-Way.

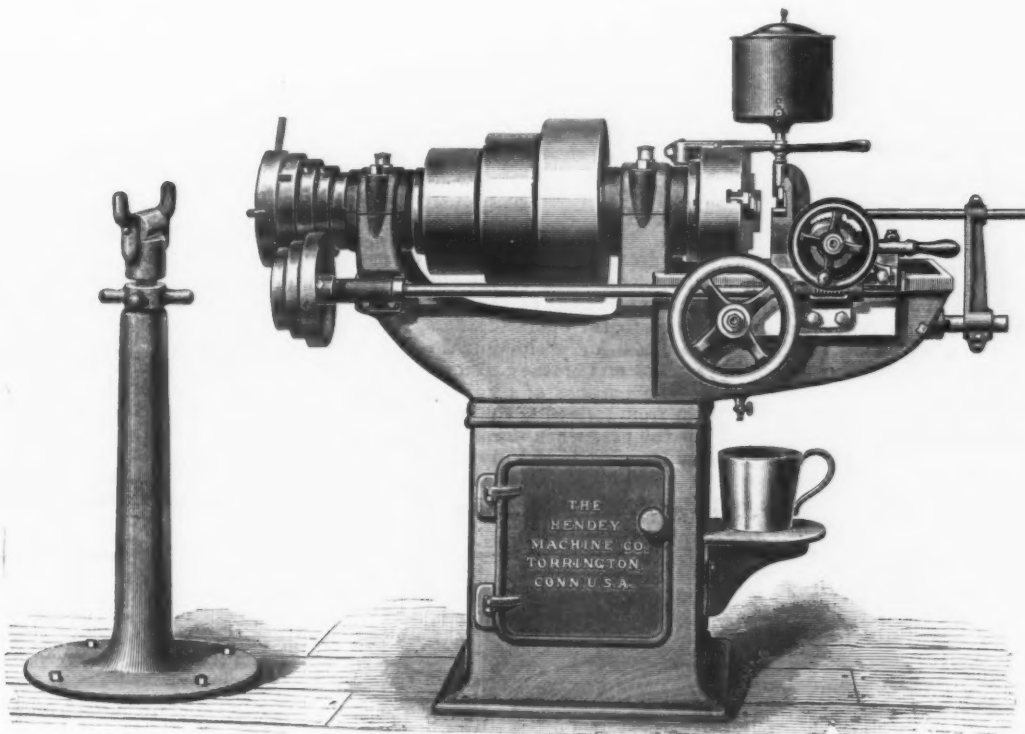
The Dominion Government is constructing a \$3,000,000 canal on the Canadian side at Sault Ste. Marie. In two years more Canada will have an independent route from the head of Lake Superior to the Atlantic sea-board. The United States cannot enjoy the same advantage because American vessels sailing from Lake Erie to Lake Ontario ports are dependent on the Welland Canal, a water-way traversing Canadian territory. The Soo Canal will be a triumph of engineering skill. It has been clamored for by politicians for two generations. Even the Government ad-

hydraulic power nearly similar to that used on the American side; but the mode of filling and emptying the lock will be different. A trench will also be built on both sides of the canal for its full length down to the level of the bottom and will be fitted with puddle up to the water surface. The contractors are Hugh & John Ryan and Allen & Fleming of Toronto and Ottawa.

Compressed Air as a Motive Power.

—The experiments now being made in Europe with compressed air as a motive power are apparently successful. The British Consul reports that in Nantes the street railways worked by this method give entire satisfaction. "The cars," he says, "are comfortable and run smoothly, with very little noise. They do not interfere with the general traffic in the streets, and their immunity from accidents is remarkable. The average speed is about

Comfort for the Farmer.—A thoughtful writer takes the following view of the agricultural situation: "The consumption of many articles of human food is overtaking production. This is especially true of wheat. The crop of this year, though claimed to be sufficiently plentiful to warrant low prices, is admitted to be some 15,000,000 bushels less than that of 1884, though in the meantime a vast area in the Northwest has been added to that formerly devoted to wheat-culture. And a considerable part of that added area is already 'playing out,' having been exhausted, at least for the time being, by continuous cropping to this important cereal. It would seem, too, that the limit of wheat production has long since been passed in Great Britain, is reached in France this year, and cannot be largely extended in either Russia or India without trenching on the uncertain soil which may not be depended upon for a yield. In Australia



CUTTING-OFF MACHINE.

mits that no pressing necessity for the canal exists; but in the completion of the last link in this Canadian route they all see an evidence of the determination of Canada to work out her own destiny on the American continent.

The "Soo" Canal will rank with its namesake on the American side. The engineers are overcoming great obstacles and deserve no ordinary praise for the boldness of their design. The canal is to extend across St. Marie Island, in St. Mary's River. Its length will be 3500 feet. The canal proper is to consist of a channelway, massive pier work at both entrances and a lifting and guard lock. The prism of the canal will be sunk to a depth of 18 feet below the lowest known stages of the river above and below the guard-lock. The summit level will possess a mean width of 150 feet, or a bottom width of 145 feet, the sectional area of water being 2700 square feet. The plans provide for a lock 600 feet long between its gates, with a mean width of 85 feet in the chamber, diminishing at both ends, but on opposite sides, to a mean width of 60 feet at the gates. The walls will form a height of 41½ feet. The gates are to be opened by

eight miles an hour, but it can easily be increased or moderated, and in case of need an almost instantaneous stoppage effected. The inventor says that his system is far more economical than horse traction, the cost of coal per machine equal to 8 or 10 horse-power being only \$1, cheaper than electricity or steam, and that the machinery is simple and requires no skilled mechanic to work it. Of course the compressed air is carried in a suitable tank, capable of resisting its high pressure, and does its work by operating something analogous to a steam-engine. To fill these tanks power is required at some central station, and it is this power, temporarily stored in the compressed air, which drives the car. The alleged advantage over electricity grows out of the fact that the cost of an expensive overhead plant is saved, and that a greater proportion of the original power used is made available than when converted first into electricity and then reconverted into power. It is probable that no reliable information concerning the commercial and economical advantages of this much-lauded system can be had until it has had a more thorough test than it has as yet received."

the discovery of subterranean supplies of water available for irrigation and a resort to that aid in our Rocky Mountain regions may yet make considerable areas available for wheat-growing, and there is room for some increase in South America. But it is doubtful if on the whole the production of wheat will keep pace during the next decade with the steady augment in the population which is now in progress and not likely to be interrupted except by war or pestilence. It may even be assumed as probable that ere long it will be found necessary for the bread-eaters of the Old World to resort to the consumption of our Indian corn as a partial substitute for wheat and rye."

We are informed that Jacob Reese, of Pittsburgh, has interested a number of Louisville capitalists in his method of reducing old steel rails of heavy sections to light sections fit for relaying. The experimental steps are being taken at the works of the New Albany Rail Mill Company, at New Albany, Ind., and subsequent operations will depend entirely upon the results shown there.

Rolling Steel Rails.*

In a three-high mill a rail is made at one heat, and generally in 11 passes, from a bloom 7 inches square, or a little larger. The first six passes are taken up in working the bloom from side to side into a billet, rudely, the shape of a rail. It is then ready for the finishing rolls. The seventh pass, or squabber, which is generally the first pass in the finishing train, is principally for forming the flanges

parting of the rolls and either shear off or make a fin. The opposite course of treatment must then be resorted to.

Side-guards are used to guide the bar to the pass and to aid in keeping it from twisting or drawing to one side on leaving the pass. Side-guards are sometimes called into play to put more metal into one side or the other of a piece by forcing it over, and compelling one side of the pass to roll the other. It is unnecessary to have a side-guard on each side of the pass when there

Of all the troubles to be overcome in rolling a rail, the overfilling of the head in the finishing pass is probably the greatest. There is no real remedy for it except returning the rolls. Since the head of the rail is made somewhat rounding, the two rolls must be parted at the middle of the head in the finishing pass. When the metal runs out between the collars it makes a fin, which is generally objected to more on account of its appearance than the harm it does (Fig. 4). The cause may be looked for in the pass immediately preceding the finishing, the leading pass. When the rail has too much stuff under its head on each side of the web on coming out of this pass, on entering the finishing there is nothing to oppose this side work at the middle of the head, where there is a space $\frac{1}{2}$ inch wide between the collars of the rolls. From this it is plain that the greater the angle under the head of the rail the more scope for the roll-turner in the leading pass, and consequently the liability to fin or overfill in the finishing pass. Rounding the collars with a file will sometimes make the overfilling less noticeable.

In speaking on the subject of the amount of draft that ought to be put on a piece of steel, no fixed rule can be given on account of the varying conditions under which a piece is rolled. However, taking nearly everything into account, 10 to 20 per cent. has been found to cover nearly all cases, when the piece is turned to receive work on all its sides. In breaking down a piece of steel light draft tends to make the sides concave; the work seems to be confined near the surfaces on which it is being rolled. Heavy draft will have the opposite effect. It follows, as would naturally be supposed, that in the same rolls the hotter the piece the more the tendency of the stuff to go out in the length; while the colder and harder the piece the more spread, and consequently the more the tendency to fin. More spread may then be looked for in high-carbon

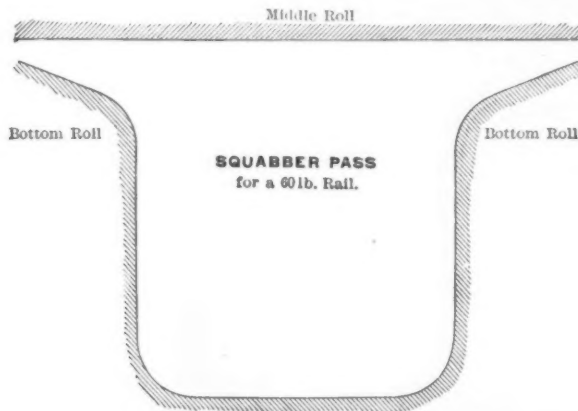


Fig. 5.

of the rail (Fig. 1). The billet goes through this pass with the head down and the flanges horizontal; the flanges are caught between the two rolls and made thinner and wider, according to the distance between the rolls forming the pass, so that this pass has almost absolute control of the flanges. The rail passes through the three succeeding passes with head and flanges vertical, without any change except uniform reduction and a gradual increase in height. Then the rail

is a greater amount of draft on one side of the bloom than on the other. The extra amount of draft on the one side throws the piece to the opposite side. There is then no need for a side-guard on the side the bar has no tendency to touch.

The purpose of a guide is to keep the bar from following the roll on coming out of the pass when for any reason it has a tendency to do so. The pass in the rolls is turned out so as to throw the piece against the guide to insure the bar being



Fig. 2.

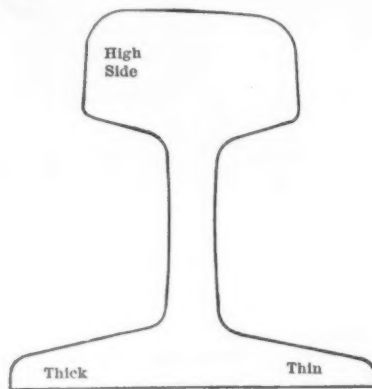


Fig. 3.



Fig. 4.

ROLLING STEEL RAILS.

goes through the finishing pass, where the head is rounded (Fig. 2), and from that it passes on to the saws to be cut.

Assuming that the passes have been properly turned out, it is the essential feature of the whole matter of rolling a rail to have them all exactly filled. If the bar does not fill out to any pass more stuff is put in the pass; this is done by enlarging the preceding pass or passes by moving the rolls apart so as to bring out a bar of larger cross-section. On the other hand, if the bar is of too great a cross-section for the pass to roll out in length the extra metal will squeeze out in the

delivered safely from the rolls. Guides and side-guards are then, exactly as their names indicate, to "guide and guard" the bar in entering and leaving a pass in the rolls. Finning and shearing comes from the metal squeezing between the partings of the rolls. It is the result, as stated above, of too much stuff going in the pass or part of the pass or the bar not properly entering the pass. A small fin, or the indication of one, is the only positive evidence there is that the bar has filled out as intended. The wedge-like shape of the flange of a rail gives a considerable amount of end thrust to the rolls. If this thrusting is not met by a force sufficient to overcome it the rail will be higher on one side than the other and have a thick and thin flange (Fig. 3).

steel than in low-carbon or mild steel. It might be here remarked that in either case the shape into which the piece is to be rolled has a good deal to do with an imperfection in the steel working out. For instance, a bad place in the part of the bloom falling to the head will work out, where it will not in the flange of a rail.

When a train of rolls is not strong enough recourse can be had to three ways of making the rolls stronger: Enlarging the diameter, shortening the body and using better material in making the rolls. For every size bar there is a roll of a certain diameter that will make that bar probably better than a roll of any other diameter. Of course such a thing as having different size rolls for every section of rail would not be practi-

* Paper read by D. K. Nicholson, of Steelton, Pa., at the recent meeting of the American Society of Mechanical Engineers.

cable. So a train is selected with respect to the average work that is to be done. Rolls of small diameter are more likely to work the flaws out of a piece of steel than rolls of a large diameter. There is very little spring in a roll with a short body. For these reasons alone it appears that the second of the above-mentioned schemes (to shorten the body) would be the one to adopt.

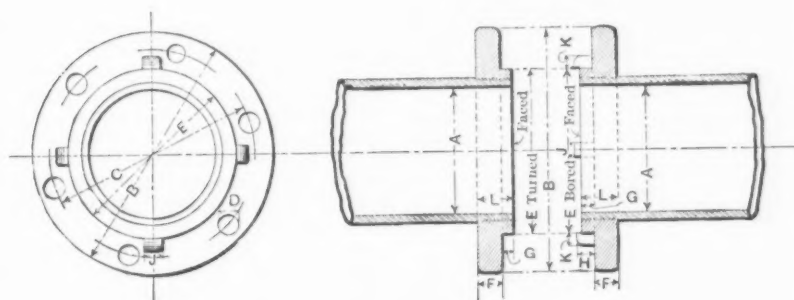
The great drawback to cast-steel rolls is the fact that the surface cracks so badly. They do very well for roughing or where enough passes follow to smooth the bar. A forged-steel roll cracks very much less

but expensive, as it cost about two and one-half times as much as cast-iron. These rolls are made in an open-hearth furnace, and contain ferromanganese and about 0.2 per cent. of carbon. Although they are harder than cast-iron, they have the ductility of commercial steel. Owing to the fact that the production of rolls is now so large, the cost of the rolls per ton of output is a very significant matter. In October the mill with which he is connected turned out 28,491 tons of rails from one train of rolls, this being at the rate of one 30-foot rail every 15 seconds, which brought the cost of rolls down to

lines in the anthracite coal regions, however, run for great distances underground, through contracted slopes and headings where it is almost impossible to make the screwed joint. In the screwed socket-joint there is always some space between the ends of the pipes, and the condensed steam from the best available feed-water is so corrosive that a cutting or furrowing action takes place between the ends of the pipes and the ferule, which sooner or later causes leakage. It is then impossible to tighten up these screwed joints without screwing up the whole pipe line.

Some of these difficulties are avoided by the use of "flange unions." With these the pipe line can be more conveniently put together underground, and in the event of a leaky thread the flange can be screwed on tighter, or a defective pipe can readily be replaced by a new one of the same length. But in the ordinary flange union there is a space between the ends of the pipes, and the above-mentioned corrosive action is so destructive to the threads that cast-iron pipes have generally been considered necessary for reliable and durable steam-pipe lines; though the first cost is about double that of wrought-iron pipe.

The flanges shown are screwed tightly on the pipe, the pipe carried in a steady rest, and the end of pipe and flange faced off flush with each other. The lugs are at the same time bored out, and the projection turned off concentric with the bore of the pipe. This insures perfect continuity in the pipes, and the lugs also center the gum-joint rings accurately, so that a gum-joint is obtained between the abutting ends of the wrought-iron pipes. The continuity of the bore of the pipe insures a free flow of steam and condensed water, so that all liability to furrowing at the joints is avoided and the gum-joint formed between the ends of the wrought-iron pipes protects the thread from all danger of corrosion. If an odd length of pipe needs to be made at a colliery, the pipe, if not over 4 inches, can be threaded with a hand-stock and die and a finished flange screwed on until the pipe projects through. The pipe must then be



FLANGE-JOINT FOR COLLIERY STEAM-PIPES.

than a cast roll, but the cost puts it out of the question. As for strength, they may be said to be everlasting. This puts somewhat of a limit on the material used for a finishing roll after going outside of the best mixture of cast-iron. In a three-high mill the passes in the top and middle rolls can be altered without disturbing the passes in the middle and bottom rolls. A two-high mill has the advantage in handling the bar, since it enters all the passes of the rolls on the same plane. And it is only necessary to have two rolls, instead of three. But then in altering a pass, shifting one roll affects all the passes except where the finishing pass is in separate housings, which is a good thing in either train. The great speed at which the rolls are run after the bar has entered the pass in a two-high reversing mill often goes against the proper formation of the rail.

In going above two lengths it is very necessary to take every precaution in putting down a mill. The long-continued strain in a set of rolls when 120 feet of rail go through is trying in the extreme on the rolls, especially as regards the end-thrust. It is only by having several set-screws and a well-babbitted surface on the lip of the brass that the rolls can be held in their proper place in single lengths. In four lengths this would probably be double, and possibly more. Of course all this is not insurmountable if all the parts are made strong enough to resist the strain put on them and the train kept in line—that is, the engine-shaft, the pinion and roll to which it is coupled having their axes in one straight line and the axes of all the rolls in the same vertical plane; for besides the train pulling hard, when the rolls are not in the same plane the piece is liable to come out twisted.

DISCUSSION.

In the discussion which followed the presentation of the above paper Mr. Hunt, of Chicago, stated that the principal objects to overfilling were railroad engineers. He believed that a slight indication of overfilling was desirable, since it showed that plenty of work was performed by the last roll, but the mills were compelled by the purchasers to produce a smooth surface. A satisfactory steel roll has not yet been made. He described in brief a small steel roll made by Johnson, of Spuyten Duyvil, which was very good

an average of 5 cents per ton. Mr. Hunt further called attention to the importance of temperature in rolling steel, and stated that many poor rails had resulted from the overheating of steel in order to make it easy for the rolls. Rolls of small diameter are easier in steel than the larger rolls. The turning of rolls has now been brought down to a mathematical nicety, so that the mechanic is not dependent on the rule of thumb.

Steam-Pipe Joint.

A paper read by E. F. C. Davis, of Pottsville, Pa., at the meeting last week of the American Society of Mechanical

Size of pipe.	Diameter of flange.	Number of holes.	φ of holes.	Size of holes.	Diagram of facing-piece.	Thickness of flange.	Depth of facing-piece.	Number of lugs.	Length of lug.	Width of lug.	Thickness of lug.	Total thickness of flange.	Length of pipe
A	B		C	D	E	F	G		H	J	K	L	
In.	In.		In.	In.	In.	In.	In.		In.	In.	In.	In.	Feet.
3	7 3/4	4	6	5 3/4	5 1/2	3/4	1/2	4	1 1/2	3/4	1/4	1 1/4	16
3 1/2	8 1/4	4	6 3/4	6 3/4	6	3/4	1/2	4	1 3/4	3/4	1/4	1 1/2	16
4	9 1/4	4	7 1/4	7 1/4	6 3/4	3/4	1/2	4	2	3/4	1/4	1 3/4	16
5	10 1/4	4	8 1/4	8 1/4	7	3/4	1/2	4	2 1/4	3/4	1/4	2	16
6	12	6	10	10	8	1	1/2	4	2 3/4	3/4	1/4	2 1/4	20
7	13	6	11	11	9	1	1/2	4	3	3/4	1/4	2 3/4	20
8	14	6	12	12	10	1 1/8	1/2	6	3 1/4	3/4	1/4	3	20
10	16 1/4	8	14	14	12	1 1/8	1/2	6	4	1	3/8	3 1/4	20

Pipe must be screwed through flange so as to be steam-tight, and flange and end of pipe faced off flush at one operation.

Engineers, describes the flange-joint adopted by the Philadelphia and Reading Coal and Iron Company for all colliery steam-pipes.

The most common and the cheapest method of carrying steam, taking the world at large, is probably through wrought-iron "gas-pipe" joined by the taper thread screwed into sockets or ferules. This answers admirably for small pipes and even for comparatively large pipes where the conditions are favorable for screwing up the joints and where the threads are not subjected to any serious corrosive action. Many of the steam-pipe

filed off flush with the face of flange. In molding these flanges it is best to have the pattern arranged to leave its own cores. This insures accuracy in the positions of the bolt-holes and the large central hole, relative to each other and to the other parts of the flange. Several thousand feet of steam-pipe fitted with these flanges have been put in service and have all proved perfectly satisfactory.

DISCUSSION.

Professor Sweet advocated in the making of joints the same method as that followed in making the joint in the cyl-

in-der-head—true the pipe up in a lathe and bolt together, making a tight joint with only metallic surfaces in contact. He would not advocate the use of either lead or oil, but would put the ends of the pipe together dry, for the simple reason that if either of these were used it would be impossible to get the ends again together after removal, since the presence of oil or lead and the necessary scraping would destroy the true surface.

Oberlin Smith described a joint consisting of a fiber ring, the inner edge and part of each surface being covered with a thin sheet of copper, which took the form of a ring having a deep annular recess around its outer side. When this was placed between a joint only the copper came in contact with the contents of the pipe, and the backing formed by the fiber gave elasticity enough to insure a tight joint. In the case of the joint described in the paper an objection was made that in case of repairs the lugs would prevent removal of a single section alone, and if this would not interfere with the removal then why not continue them and make a telescopic joint?

Plans of New Works.

We recently announced that the well-known firm of Pedrick & Ayer, of Philadelphia, manufacturers of plain and universal milling-machines, boring-machines, &c., had moved into their new works on Hamilton street and extending through to Buttonwood. The new building has a frontage on each street of 40 feet and a depth of 160 feet. We present in the drawings on page 841 floor plans of each of the two stores, together with the arrangement of the planers, lathes, screw-cutting machines, cranes, &c.

The first floor is occupied by the heavy machinery used in connection with the manufacture of the larger sizes of universal milling-machines, and in order to facilitate the handling of the heavy parts the iron posts of this story are provided with swinging cranes. In addition, there is also a line of overhead trolleys adapted to the same purpose. In order to secure a solid foundation for the heavy tools used there is no basement under the greater portion of the building, but under the Buttonwood street front there is a basement, in which the boiler and engine are located, and a part of which also serves as a store-room. The boiler room is covered with brick arching on iron beams; and over this is placed the forge and large steam-hammer built on a special foundation. On the second floor are located the offices, drafting-rooms, pattern-room and that portion of the machinery which is not excessively heavy in itself, and which of course handles no unusually large pieces.

The engine that furnishes the power is 12 x 24 inches, Corliss type, 50 horsepower, built by Pedrick & Ayer, excepting the governor and part of the cutting-off device, which were furnished by the Watts-Campbell Company, Newark, N. J. The boiler is 50-horse and was made by the Taylor Mfg. Company, Chambersburg, Pa. It is 54 inches in diameter, 16 feet long and has 38 4-inch tubes. It is so set that the return-heat, after passing through the tubes, returns over the top. Owing to the position of the stack it carries off the smoke and gas from the boiler, furnace and smith fires, and by its construction makes two complete flues. The stack is square, is built of brick, and is lined inside with a heavy 20-inch cast-iron pipe that conveys smoke, &c., from the furnace. It being continually hot rarefies the air around it in this space, the smith fires are attached and excellent results follow, as there is no smoke from them, and around the forging-shop it is as clean as

any other part of the works. The Mather system of electric lighting is used, the dynamo being driven by shop engine. The elevator is a 3-ton, built by Morse, Williams & Co., and connects the casting-room in basement with the first and second floors. The shafting was furnished by G. V. Cresson and is $2\frac{3}{8}$ inches in diameter and runs 125 revolutions per minute; split or half pulleys are used exclusively throughout. The engine and boiler consume about $2\frac{1}{2}$ tons of buckwheat coal per week, and this economy is due to having a first-class automatic cut-off engine, a Walker automatic damper-regulator that regulates to $\frac{1}{2}^\circ$ and an Eckstein feed-water heater that works continually while engine runs and pumps water from 206° to 210° into the boiler. Owing to the position of the plot of ground no light could be obtained other than from the ends of the building and from the roof. The sky-lights, 30 x 15 inches each, light the building in a very satisfactory manner throughout.

Ferro-Aluminium in Foundry Practice.

W. J. Keep, of the Michigan Stove Company, Detroit, has just published in the "Transactions" of the American Institute of Mining Engineers, a paper on aluminium in cast-iron, from which we quote the following conclusions:

Practice.—The object of these papers upon the influence of aluminium is not to encourage the introduction of aluminium into cast-iron when it is remelted, but to point out the fact that aluminium, if present in pig-iron, would change combined carbon into graphite, as silicon does, but without weakening effects. With our present experience, the introduction of aluminium into molten cast-iron is attended with serious difficulty.

If ferro-aluminium broken into very small pieces is introduced into the ladle before the iron is caught it will probably be melted as the first iron strikes it; but if plunged into the iron after the iron is caught, it is likely to chill a coating of iron around it. In this condition the metal swims. The attempt to melt such chilled pieces in the ladle of iron is useless. Commercially pure aluminium thrown on the surface of cast-iron melts at once and forms a film on the surface which seems to sink into the iron and form a true alloy. Yet the whole amount thus introduced does not seem to remain in the iron, as it does when successfully introduced by the ferro-aluminium. The surface and the sides, after the iron is poured out of the crucible, seem to be covered with aluminium. Aluminium introduced into the foundry-ladle in the smallest quantities causes the iron to boil rapidly, probably because the particles of graphite which it liberates are light. This ebullition is so rapid that slag which has risen to the surface is often carried under again by the force of the current.

A more unfortunate effect is that the film of oxide and slag covering the surface of the iron in the ladle is made so tender by the aluminium that it does not hold together while the iron is being poured. As a result, patches of scum break away and flow with the iron into the mold, doing more harm than if such impurities had not been cleared from the iron. It might be better if the aluminium could be introduced into the hearth of the cupola before the iron is tapped, so that it could have time to cause a separation of slag, leaving the slag inside the furnace. We have endeavored to overcome these difficulties by introducing the ferro-aluminium with the charges of pig-iron, but this is not a desirable method if a better one could be found.

The value of our discovery regarding the action of aluminium upon carbon is to

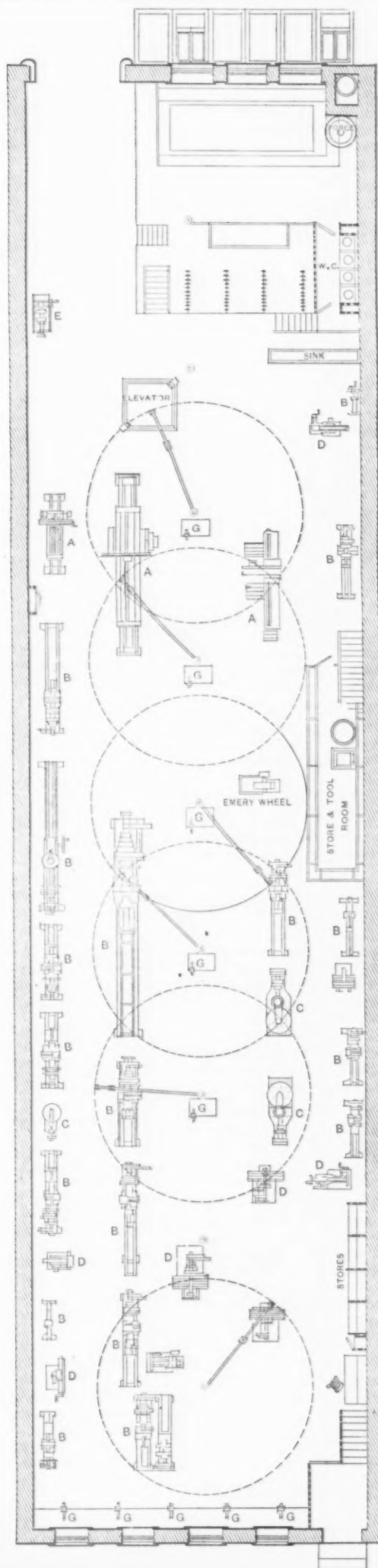
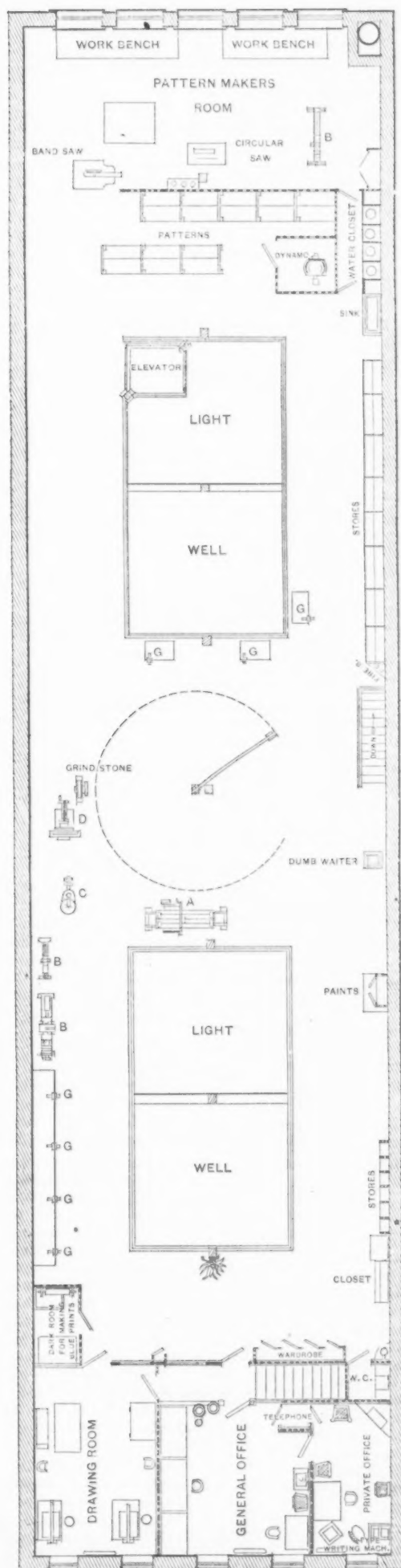
show the desirability of the introduction of aluminium into foundry pig-iron during its reduction in the blast-furnace, and to call attention to the fact that this is the most desirable element in such irons, if an iron without chilling tendencies is sought. If introduced into the pig-iron during its reduction in the blast-furnace, as silicon is now introduced, none of the evils referred to would be encountered.

A misconception seems to prevail as to the use of aluminium, even if it were not attended with the practical difficulties referred to. It is not to gray, but to white iron or iron low in silicon that aluminium can be added with advantage. Any addition of aluminium to irons already made gray by silicon, and consequently weak, would cause a further separation of graphite and consequently make the iron grayer and weaker. While silicon and aluminium work together to make iron gray, yet if the silicon be left out and aluminium used instead the iron will be grayer, stronger and softer than if silicon were the agent. We do not advocate the addition of anything to pig-iron unless it be unavoidable. Purchase pig-iron that will of itself, or when mixed with other brands, make such castings as are desired without any doctoring. If irons can be found that are made gray by aluminium such irons would be very desirable for the making of thin castings where strength as well as softness is desired.

The total amount of the successful bids for the Brooklyn WaterWorks extension is \$3,071,692, a slight excess over the engineer's figures. The lowest bidders on the first section are Cranford & Valentine, for the laying of the new conduits, the amount being \$1,013,772. Edward Freel bid the lowest sum, \$762,678, on the second section for the new storage-reservoir. On the third section, for the laying of the main from the Milburn pumping station to the new storage-reservoir, John H. O'Rourke bid \$63,123. The construction of buildings at the Milburn pumping-station will also go to Mr. O'Rourke at \$154,845. He also made the lowest bid, \$367,167.50, for the supply ponds at Milburn and East Meadow. James F. Gillen bid \$306,145 and \$373,965, respectively, on the work at the New-bridge supply pond and conduit and the supply ponds at Ridgewood and Massapequa, distancing his competitors.

The main building of the Hecla Iron Works, in Brooklyn, was destroyed by fire on Monday night. The works are owned by N. Poulson, M. Eger and B. E. J. Eils, and are valued at about \$200,000. The estimated loss is nearly covered by \$100,000 insurance. The fire broke out in the foundry and was attended by an explosion. The burned building was five stories high and was almost entirely destroyed, including a portion of the one-story foundry building. Mr. Poulson said that he could give no idea of the origin of the fire. A large number of valuable patterns were destroyed, but those for the *World* building were saved. The works had a large number of contracts on hand, and so great was the press of business that an addition to the works was in progress. The company will lose by forfeiture of contracts. The works are known throughout the country as manufacturing every description of iron-work. The fire will throw 1000 men out of employment.

The first bale of manufactured ramie ever made in this country was exhibited at the Cotton Exchange 21st inst., and there is reason to believe that its appearance marks the beginning of an important industry. This ramie was prepared at Englewood, N. J., under the process used by Mr. Ferry, the French Senator.



A—Planers, B—Lathes, C—Boring Mills, D—Universal Milling Machines, E—Screw-Cutting Machines, G—Vise.
PLAN OF NEW WORKS OF PEDRICK & AYER.

THE WEEK.

A tunnel one mile in length directly under one of the principal streets in the city of Baltimore is talked about, in preference to building an elevated railroad. If built the Baltimore and Ohio Railroad Company and the other railroad corporations will probably use it jointly.

The Pennsylvania Railroad Company are considering the advisability of running a new ferry line from Jersey City to the foot of West Thirteenth street, in this city.

Plans have been filed for the new music hall on Seventh avenue and Fifty-seventh street, in which Andrew Carnegie is largely interested. The building will be a large structure, having 150 feet frontage and extending 175 feet in the rear. The materials to be used are Aberdeen granite, terra-cotta, brick and iron. The roof will be constructed of iron, and the building will be absolutely fire-proof. It will be finished a year hence at a cost of \$1,100,000.

In accordance with the advice of Mr. Powderly the Knights of Labor will not sanction a general strike in May next with the object of making eight hours a day's work. It would do more harm than good.

Col. Albert A. Pope, of Boston, delivered an address at Syracuse on the subject of the improvement of highways to facilitate travel of all kinds. Colonel Pope is well known as the founder of the American bicycle industry and president of the Pope Mfg. Company.

Duplicate screws are found to be advantageous as well as duplicate boilers. The City of Paris broke a crank-pin when 1400 miles west of Queenstown, but proceeded under her starboard engine alone at the rate of 15 miles an hour.

Mayor Grant's rapid-transit scheme will be pushed vigorously in the next Legislature.

Krupp says he never entertained any idea of locating gun-works in the United States.

The Lenox Lyceum, now approaching completion on Madison avenue and Fifty-ninth street, is a fine specimen of architecture. In the engine-room is machinery for forcing hot or cold air into the various parts of the building. The impure air can be drawn from the rooms of the house and fresh air, cooled in an ice-vat in the cellar, substituted for it in a few minutes.

A Honolulu paper publishes statistics showing that \$29,880,000 have been invested in sugar plantations in the Sandwich Islands, three-fourths of the total by Americans. Trade with San Francisco is constantly increasing.

Alabama coal ought to find a large market in the West India Islands, judging from the success which is attending the trade between Pensacola and Cuba. The first requisite is the improvement of the interior water-ways of Alabama, so as to furnish a cheap route from the mines to the Gulf.

The commission appointed to select the most desirable location for a new Southern navy-yard report in favor of Algiers, opposite New Orleans, where the Government has a reservation. A dock would cost \$840,000. A dock and naval depot at Port Royal are also recommended.

Floods in the Yang-tse Valley have caused great destruction of rice.

The new Brazilian flag was taken out by the steamer Advance from this port and will be displayed on entering the harbor. The flag is designed exactly like the

American ensign, except that there are 18 stars in the jack and the stripes are yellow and green alternating, instead of red and white, like ours.

A cable will be substituted for horsepower on the Broadway and Seventh avenue, in this city, the conditions imposed by the municipal government having been accepted.

New Orleans is much pleased with the appointment by the Secretary of War of a commission of engineers to report on the proposed bridge across the Mississippi immediately below the city, but anxious to avoid placing any obstruction to river navigation.

With sugar on the free-list, the Mexican *Financier* says the exports of sugar from Mexico to the United States would in a few years amount to \$50,000,000 per annum.

A Boston paper says that African trade with that port is increasing, although profits are cut down, compared with what they were formerly, by British competition and in consequence of the reduced value of palm-oil. There are about a dozen American vessels in the trade and a Portland merchant is building another.

Manufacturers in Pennsylvania, according to report, are preparing a floating exhibit of American products, after the plan adopted in Germany, and are about to fit out a large steam-ship as a sort of commercial museum, to be dispatched to South American ports. In this way they propose to demonstrate their ability to supply the markets of this hemisphere, not excepting the republic of the United States of Brazil.

Chief Engineer William H. Brown, of the Pennsylvania Railroad, has submitted to the city of New Brunswick a plan by which the tracks of the road will be elevated throughout the city. In Elizabeth similar proposed improvements will cost \$3,000,000.

The United States Mint Director, Mr. Leach, says the value of silver has fallen 20 per cent., notwithstanding the fact that since 1878 the Government has bought this metal to the extent of \$287,000,000, and that it would fall to 50 cents per ounce if purchases ceased.

The latest estimate of the cotton crop is between 7,600,000 and 7,800,000 bales.

The silk industry in the United States is active. Although imports of the raw material are abnormally large and valuations are high, all receipts are quickly absorbed.

Immigration during the last four months is less than for the corresponding period last year, the total being 141,839, as compared with 156,964 in 1888.

Another great railroad alliance is announced, this time between the Rock Island, the Atchison, Topeka and Santa Fé system and the Atlantic and Pacific Railroad. The new line is to be called the Rock Island and Santa Fé, and is 51 miles shorter from Chicago to San Francisco than the Northwestern Union Pacific Railroad or the Central Pacific. The agreement goes into effect immediately. It provides that for 99 years the new route shall be maintained in spite of any or all other outside deals, consolidations or combinations. Dodge City, Kan., is made the dividing point of all east and west bound traffic. All freight is to be handled in through cars and is to go on through billing from origin to destination.

The Old Dominion's steam-ship Manhattan, from New York for West Point, Va., was sunk by a collision with a four-masted schooner on the 21st inst. She was struck just abaft the collision bulk-

head and went down in 15 minutes. Chief Engineer Chas. J. Hayden, of Paterson, N. J., and several of the crew were drowned. There was no time to lower the collision-cloth over the opening in the iron plates and the bulk-heads were useless. The Manhattan was built by John Roach in 1879.

The Western Twine Trust is assumed to have met with defeat. The Illinois grangers, smarting under the alleged extortion of a formidable combination, sought relief by offering a reward of \$10,000 for a machine to bind grain with straw. Forty inventors responded, and one of them is declared to have produced a machine that is entirely satisfactory. He declines all overtures for the purchase of his patent, preferring to put it on the market himself. As the grangers will be compelled to use the machine, perhaps their situation is not improved.

The French Minister of Marine calls for more money for the construction of iron-clads.

The Bank of California has a large force of men at work constructing an irrigation canal 14 miles long, to irrigate a tract of 50,000 acres that the bank owns in Fresno County. The canal will be 60 feet wide and 6 feet deep. This tract of land will be cut up into 20-acre farms and placed on the market.

The United States has at present four steel cruisers and a steel dispatch vessel in commission. The Baltimore, Vesuvius, Petrel and Charleston have had their trials and may be expected soon to take their places in the cruising fleet. There are 21 wooden steamers and 7 iron steamers still useful and serviceable. With the completion of the vessels now building and appropriated for the United States will possess 10 armored vessels, 13 single-turreted monitors, 21 steel cruisers or gun-boats, 2 dynamite cruisers, a practice cruiser for cadets, an armored ram, one first-class torpedo-boat and seven iron steamers. The 13 turreted monitors are said to be in a state worse than useless.

Proposals for furnishing 8000 pounds of tinned steel wire of square cross-section of $\frac{1}{10}$ inch on a side for wrapping guns have been opened by General Benet, Chief of Ordnance. There were but two bids, those of R. H. Wolff & Co., of New York, at 15 $\frac{1}{4}$ cents per pound, and of Rowland & Robbins, of New York, at 19 $\frac{1}{10}$ cents per pound.

A declaration of independence by the "United States of Australia" is said to be an event not very remote. Australia desires to be supreme in the Pacific and may become a strong maritime power. Canada also betrays an itching for independence.

Large amounts of gold are being shipped from China to Europe in exchange for silver. This process has been going on for several years, but of late the movement has acquired unwonted volume. The United States Consul-General at Shanghai says the shipments from Tientsin have increased from 574,414 taels of 1 $\frac{1}{4}$ ounces in 1882 to 1,044,459 taels in the first half of 1889. One cause for the shipment of gold is said to be the high price as compared with silver, which has induced the wealthy Chinese, who are understood to keep large amounts always hoarded, to exchange it for silver. The difference in value is so great that in Shanghai an ounce of gold is equivalent to 23 $\frac{1}{10}$ ounces of silver.

The four steel cruisers constituting the squadron of evolution consume about 500 tons of coal per diem, costing in New York \$4.50 per ton, and four others soon to enter the service will each consume from 200 to 310 tons per diem. It is estimated that the future expenditure for coal in the navy will not be less than \$900,000 a year.

The Iron Age

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On account of Thanksgiving Day *The Iron Age* goes to press a day earlier this week.

The Advance in Steel.

During the past month or two we have repeatedly called attention to the fact that the principal impetus of our steel industry has come to it through the transfer from foreign to domestic mills of the large amount of orders which flowed to makers abroad, principally from our wire mills. They bought annually about 200,000 tons of wire-rods or billets, business which was quickly cut off when prices rose rapidly there, particularly on billets, because to every advance in the foreign markets there was added 45 per cent. of that advance on account of ad valorem duty. In wire-rods this progressed until it became cheaper to import No. 5, on which the duty is specific while at a 45 per cent. ad valorem duty on No. 6 rods.

This increase in the demand upon our home works for soft steel, coupled as it was with an expansion in the consumption when it was selling at the same rate as iron, caused a rise in Bessemer pig and manganese material. It forced the manufacturers of structural steel, plates, shapes, cut and wire nails and wire to raise their prices. There has been a growing gap between the prices of iron and of steel in all these lines of manufactured and staple goods. It has become so large now that it must seriously affect the quantity of steel required and lead to a corresponding development in the consumption of puddled iron.

Early in August last, in the Pittsburgh market, mill pig was selling at \$14.25, while Bessemer pig-iron was quoted \$16.75, a difference of \$2.50 per ton. Lately mill iron has been selling at \$16.75 while \$21 was demanded for Bessemer pig, a difference of \$4.25 per ton. Muck-bars and steel slabs were worth \$27.50 and \$28 respectively in August. Recently they have stood \$30 and \$34, a difference of \$4 per ton where formerly both were within 50 cents a ton of one another. These same differences are reflected in the price of finished goods. Iron cut nails in the East are now obtainable at \$2.10, delivered on dock in New York, while steel nails are hard to get under \$2.30. On staple goods like these buyers will not pay such a difference in the long run, and for structural work specifications calling for steel are very apt to undergo revision when the saving in dollars and cents is pointed out to the consumer. Wire-rod mills which are getting \$49 a ton for rods which cost them \$42 or \$43 to make on the basis of \$34 billets can afford to purchase steel even at higher figures. But no such exceptional margins exist in other lines, and

the temptation to substitute iron for steel is very great indeed, both to the manufacturer and to the consumer.

It would appear under the circumstances that the conclusion is safe that either Bessemer pig and soft steel are too high or mill iron and muck-bars are too low relatively. The reasoning naturally would be that the next rise must lead to a closer adjustment of the values of the two lines of raw material.

There is another point which this disparity calls attention to, and that is that the situation is particularly favorable for the basic process, and especially to the basic Bessemer converter. Even the basic-lined open-hearth furnace has a much better show at this juncture than it has ever had.

Higher Wages in Europe.

The student of political economy cannot fail to be greatly interested in the recent developments which are affecting European industrial interests. Underlying the remarkable rise in prices, which naturally attracts most attention because it directly appeals to the commercial sense, is the question of the future condition of the European wage-earner. Will he be able to secure such an advantage in the present prosperous condition of European trade that the standard of wages paid there can be permanently advanced? Wages in America are naturally compared with those of Europe, and we have fallen into the habit of regarding European wages as almost immutably fixed within a very narrow limit of fluctuations, but inclined to descend a little lower in the scale if any special propensity in either direction be recognized. American wages are regarded generally as being abnormally high, and the belief is quite common, even among the warmest friends and well-wishers of workingmen, that the time will surely come when through the increase of our population and the overcrowding of all avenues of employment the standard of wages paid here will gradually fall lower and lower until the level of the European wages is reached. Tariff protection will enable high wages to be paid only so long as the country in which it is enforced does not produce more than it can consume. In many branches of business we have reached and passed that point, and the effect has been seen in the gradual reduction of wages from the very high rates which at one time prevailed here and made America the paradise of the workingman. We are now standing on the threshold of a new period in our manufacturing experience as a nation, and the events of the next few years will be of momentous consequence to those who earn their bread by the real and not metaphorical sweat of their face.

To the great comfort of the American workingman it is apparent that the European situation has seldom been more encouraging than now to their hopes of maintaining a high standard of wages on this side of the Atlantic. Advantage is being taken by British and Continental labor reformers and agitators of the present activity in trade to force wages upward. The success of the London dock laborers and the London bakers in their recent strikes greatly promoted the cause of labor in general. The Staffordshire and Worcestershire nail-makers demand

an advance of 25 per cent. and will probably maintain a prolonged contest if it is necessary to carry their point. Coal-miners have already been advanced, and workers in iron and steel have participated in the improvement in business through the automatic operations of the sliding-scale. While British wages have been most prominent in the calculations of American economists, German and Belgian wages have in their turn been the *bête noir* of British manufacturers and workingmen. Longer hours of labor and lower pay prevailed on the Continent. But even in that direction the cause of the workingman is looking up. Belgian and German wages are advancing, and trades-unions are being formed among the wage-earners to guard and enforce their rights. In Germany the influence of the crown has been conspicuously exerted in favor of the men and in opposition to the masters.

It is quite reasonable to assume that the higher wages are abroad the easier it will be to maintain a standard of good wages in this country. If it were possible to establish a minimum rate of even \$1 a day for ordinary labor in European countries which could not be broken down by any combination of employers, but would be as rigidly maintained as are some minimum rates of wages in this country, it would undoubtedly be better for the European masses and therefore better for the countries in which they live. The purchasing power of the people at large determines the prosperity of a country much more than their willingness to labor cheaply and to live meably. The world would be much improved if this could be accomplished, and the labor agitators who would devote themselves to such a work would confer a great blessing on humanity.

We have been asked the question several times recently, "What are foundry men now doing who have always insisted that they were obliged to have some Scotch pig-iron as part of their mixture?" The great advance in prices abroad of course prompts the question. Foundry men who have been interviewed on the subject give various answers. Some, especially in the East, have still on hand or under contract a supply which covers their immediate requirements. What they will do when that is exhausted they leave for the future to determine. Others, and a far more numerous class, have cut loose from Scotch pig-iron entirely, using in its place Ohio softeners of practically the same characteristics, realizing the same results. They will probably not return to the use of Scotch pig-iron again unless radical changes, now most unlikely, should occur in the iron market here and abroad. But the great majority of our foundry men have cut loose from all past practice and are making satisfactory mixtures with Southern soft grades or Northern high-silicon irons. We have recently been shown numerous specimens of difficult foundry work made by enterprising molders in which not a pound of Scotch pig or any other special softener had been used. But a few years since such work would not have been attempted without a most carefully compounded mixture. Present foundry practice is in the direction of the intelligent use of pig-iron according to its own chemical constituents and without

the blind adherence to tradition which involved a constant reliance on one particular kind of iron as part of the mixture.

The Advance in Silver.

On January 1 silver was worth 42½d an ounce in the London market; its present price is 44½d. Up to June the quotation fluctuated but little, but ever since the tendency has been upward and is due to a variety of causes. Since the Continental States belonging to the Latin Union suspended the coinage of silver the chief consumers of silver were the United States and Eastern Asiatic nations, British India in particular. Latterly it has been found that our own country begins to absorb silver dollars more easily than it did last year, since an increase of domestic trade requires a more extended circulation, whether it be coin or paper. The demand for silver coin has besides to some extent been stimulated in the West by the silver men, especially in the new States and Territories, sufficiently so to become perceptible at the Treasury and banks. British India, China and Japan, too, have consumed more of the white metal this year than heretofore in consequence of the larger exports from those countries to Europe and the United States in a more active business year; in fact, the exports thence largely exceeded the imports of European and American merchandise, and the difference was made good in the shape of silver or its representative remittances. In British India alone no less than the equivalent of £3,000,000 has been absorbed in the shape of silver in excess of last year the first eight months of 1889. Next to this the monetary policy carried out by the English Chancellor of the Exchequer, Mr. Goschen, has favorably influenced the silver market by his withdrawal from circulation of the half-sovereigns coined so far during the reign of Queen Victoria. In substitution for these silver crowns and half-crowns have been put in circulation exclusively. Hence the mint in England has been a buyer of silver to a not inconsiderable amount, and the transformation is still going on. As a legal tender silver can only be given in payment in a single case to the extent of £2. There is some apprehension in England that small depositors may crowd practical silver coin on the banks which in the end they cannot get rid of conveniently, since the wholesale dealers and middle classes shun silver coin. But this is a minor element compared with the influence which the United States and India can bring to bear on the metal either through the ordinary trade developments or special legislation. At the same time there is the possibility that Germany may sell its 80,000,000 old thalers should silver appreciate materially in the near future.

As for production, so far as it is known to proceed in the United States, Mexico and Bolivia, the chief producing countries, it is not likely to fall much short of what it was last year; on the contrary, there may be some increase, but the latter is not likely to be even approximately what the extra requirements evidently demand, unless, indeed, Germany sold the old coin. Countries that may buy a goodly amount of silver next year—if former plans are to be carried out—are Russia,

China and Brazil. Silver has consequently entered upon a phase in which it will have to be watched more closely than has been the case at any time the past five years; it has once more become extremely sensitive. The near future will be influenced by the forthcoming message of President Harrison, together with the report of the Secretary of the Treasury, Mr. Windom. They will afford the country a clear insight into the silver policy of the Administration. The majority of financiers and merchants are rather afraid of any new silver legislation by Congress and would prefer to let well enough alone.

Encouraged by the rise in silver, the Western silver men are, moreover, louder and more energetic than ever in their demands; if they cannot get free coinage they hope to get \$4,000,000 of silver coined per month instead of \$2,000,000; hence what has leaked out of Mr. Windom's intended policy has been compassed with a great deal of interest. If what has been published is true, his course will be extremely conservative, so much so as to excite the wrath of the silver men. The impression has gained ground that, at any rate, the Administration is far from being prepared to surrender at discretion to the clamoring silver men. Its firmness against the country being flooded with silver would of course go far to impress Congress. Hence the unusual degree of interest that attaches to the silver question, one of the most difficult and intricate a legislative body possibly can have to deal with.

Quite a flurry was caused in the Western iron trade on the 14th and 15th of this month by the publication in the daily press of a Glasgow cable dispatch announcing a break of 13 shillings in Scotch warrants. Such an extraordinary decline was at once taken as an evidence of the complete collapse of high prices for iron and steel in Great Britain, and it was assumed by some very bright business men that the American market would sympathize and prices would at least go no higher here. Quietly they began to unload, and advised their friends to do the same. A considerable quantity of material was sold with astonishing ease and at full prices, as consumers generally had not seen the disquieting news and were glad to get more stock, when, to the chagrin of the sellers, the subsequent newspaper issues reported that the cable dispatch had erroneously stated shillings instead of pence, thus divesting the news of its sensational quality entirely. As prices are steadily hardening, the sellers would like to regain possession of the material which they so hastily and rashly sold. Moral: Put not your trust in cable or any other dispatch in the daily press.

Gordon, Strobel & Laureau, of Philadelphia, have secured the contract for the building of two plants of Gordon fire-brick stoves for the North Cornwall anthracite furnaces of Robert Coleman, of Lebanon, Pa.

The Spanish Government has awarded the contract for the building of the new water-works for Havana to the American firm of Messrs. Runkle, Smith & Co. The amount to be paid is \$2,000,000.

LONG-TIME CONTRACTS.

PIG-IRON MERCHANTS DISCUSS THEM.

In response to the following letter, addressed to the leading pig-iron merchants in the country, we have received a number of communications which will be read with interest by the trade:

Leading manufacturers of pig-iron have expressed themselves to us very strongly in favor of changing the time-honored custom of making long contracts for future delivery. They allege that it too often happens that such contracts are in the nature of options. A buyer will order, say, 300 to 500 tons per month for six, eight or ten months. If a rising market follows he will call for the maximum quantity, but if prices fall off he will take the minimum, and should the decline be heavy he may ask to have the order canceled or the shipments deferred, or he may condemn the quality of the iron and wholly repudiate the contract. Sales of this character are therefore speculative to a great extent, even if the iron is intended to go into the hands of a consumer. The manufacturer takes all the risks of advances in ore, fuel, labor and freights, and at the same time deprives himself of all opportunity of benefiting by a corresponding rise in the market price of pig-iron.

It is believed that the practice of making long-time contracts is not so thoroughly rooted in the trade that it cannot be changed if that should be the wish of the majority of the manufacturers. If contracts were made to cover three months' deliveries as a maximum the interests of both buyer and seller would be fairly protected, while the manufacturer would certainly be in a better position to protect his own interests than he has too often found himself in the past.

As the time is rapidly drawing near when season contracts will be placed, the discussion of this question is decidedly pertinent. We therefore request that you give us your views relative to it, and if you oppose long contracts to suggest a method by which the trade could take common action. If you know of abuses which exist or are perpetrated in consequence of the long-time system we would like to be informed of them most particularly.

Chicago.

PICKANDS, BROWN & Co.—It is and has been a time-honored custom among the manufacturers of Lake Superior charcoal pig-iron to sell a percentage of their product distributed through a series of months running from eight to ten months, such contracts being made largely with agricultural implement manufacturers, car-wheel makers and malleable iron works. The charcoal-iron producer can the more readily do this, as his purchases of ores are made on the same basis, and his fuel supply is regular and not subject to any great variation in cost. For this reason we think there is no great objection among this class of manufacturers to making long-time contracts, and in our experience of many years we have never encountered any trouble either from the advance or decline in the markets. On sales, however, of coke pig-iron our idea is that it would be very much better, both for the buyer and seller, if sales were confined to periods not exceeding four months, as the variation in fuel supply, labor and rail

freights (the latter of which is largely a governing factor in this district) makes prices at nearly all times uncertain. A general rule restricting contracts to periods of not exceeding four months would in our opinion in the long run be equally beneficial to buyers and sellers.

CHAS. HIMROD & Co.—We are not in the habit of making contracts for optional amounts, except with the understanding that the purchaser uses this iron for all he may need during that time of that character of iron. We depend upon the honesty of buyers to deal with us fairly, and we can say that we have no great cause of complaint that they have not done so. As for long contracts in general, while they are many times objectionable, we cannot see as there is any way of avoiding them. The consumer of pig-iron must contract his output over long periods of time in order to protect himself, and must if possible buy his raw material for the same period. We think it no more than fair that the manufacturer of pig-iron should help his customer by making contracts to give him such protection. We find that we made as much money in the long run by selling ahead on a declining market as we have lost by selling ahead on an advancing market. While many complaints have been made that buyers will not take iron if the market goes against them, but will want it all if it goes in their favor, we do not believe that his complaint is really well founded. We have had very few instances where customers declined to take iron on account of a falling price. Any one who would do this, we would prefer not to sell them either a long or short contract.

JOHN McLAUCHLAN, ANDREWS BROTHERS COMPANY.—We have always been opposed to long-time contracts and options both in pig-iron and in our finished product, and usually insist on fixed amounts and a limited term for deliveries, say not to exceed three months. This is evidenced by the attached circular which we have just sent out. The exceptions to this rule are mainly cases of contracts with agricultural implement manufacturers who make annual contracts and will consider bids in no other way. The objections to long-time contracts and options are just as you state. If the price goes up, maximum quantities and even an extension of time for deliveries are frequently wanted. If prices decline the minimum quantity rules, and instances are not rare where specifications are withheld and quibbles arise about grade, quality, &c., resulting in practical cancellation. Long-time contracts and options are fostered by a certain class of commission sales agents who seem to work solely in the interest of the buyer, and know no other word than tonnage. "Tonnage is what I'm after" is the way we have heard them put it. They then explain to furnace and mill owners the absolute necessity for making such concessions. If the latter parties would issue more stringent instructions to such agents the reform that you have suggested would be the more speedily accomplished.

Cincinnati.

ROGERS, BROWN & Co.—The topic you refer to in yours of 13th is one that is of live interest to the pig-iron trade. As you speak of the custom of making long contracts for future delivery, it is apparent that you have reference more particularly to the practice in the East. West of the Alleghenies there is nothing that corresponds to general renewal of long-time contracts about the first of the year. The only buying of this class West that has settled into a custom is the placing of contracts about midsummer by the large agricultural machine manufacturers. This is generally done in July, the purchases being sufficient for the requirements of the manufacturing season, running from eight

to twelve months. Apart from this, buying follows no rule or custom that anybody has been able to find out. The dull season of one year is the active season of the next. Buyers take hold freely when they think market conditions are favorable and stay out as long as they possibly can when prices tend downward. The largest buyers have in recent years followed the practice of buying for deliveries two, three and even six months forward. The average of such contracts, we should say, is less than three months. Very few foundries are so situated that they can receive a large block of iron at one time, and very few buyers care to be bothered with frequent renewal of purchases.

Our opinion is, after a good deal of careful observation, that this method of moderate scattering of deliveries is the best for all parties concerned. On the part of the furnace company it gives stability to the business, preventing accumulation of iron, and providing orders on which continuous shipments can be made. It affords a basis on which calculations of cost and profit can be made; cultivates closer and pleasanter relations between producer and consumer, and in the end realizes as good or better prices than where the iron is first accumulated and then forced to sale in blocks for immediate shipment. On the part of the consumer, it enables him to base his calculations on a uniform supply of the same grade of iron; to bid for contracts for work knowing what his raw material will cost without having to put it all in advance; enables him to run uniform mixtures without danger of failing in supply of certain grades and gives him an opportunity to exercise his judgment as to the most advantageous time to buy.

Speaking for our Western markets, we must say that it is very rare that a reputable buyer at this late date cancels contracts of this kind on technical grounds when the price goes against him, and it is an almost unprecedented occurrence for a furnace company to treat such a contract except in perfect good faith on an advancing market. A few years ago, when grades of Southern iron were unsettled and it was hard to arrive at standards of quality and grading, there was abundant opportunity for such complaints and cancellations, and it was improved in many cases. Now that Southern iron, which dominates the Western central markets, is settled into well-defined standards of quality and grading, it requires to cancel a well-drawn contract on technical grounds more of what is termed "gall" than most of our Western consumers care to exhibit. In the South also the basis of cost with the furnaces can be figured with approximate accuracy a year in advance, and a furnace man selling half of his product for six months ahead at a fair margin of profit usually considers that instead of speculating with his futures, by this course he is doing the very reverse and taking the conservative course of accepting satisfactory profit when it is offered rather than to take his chances on a higher or lower one later. We have observed that the companies that have pursued this policy conservatively have met with the most uniform success. Naturally, on an extremely low market they run their orders down to a low limit and on a high market expand them as much as possible.

The practice you mentioned of drawing contracts for future deliveries indefinite in quantity has fortunately never found a foothold west of the mountains. It is in all cases insisted upon that the quantity sold must be definitely stated, and no element of option enters in, except in the very limited way stated. There is also no parallel in the West to the Eastern practice of formally fixing prices and then entering contracts for 12 months forward. That course, unless the limits of cost are fixed for the same period, would be rather

too speculative for even our rapid Western ways. Furthermore, we have never quite been able to understand in this region how one man or company can announce on a given day what the market for iron is to be for the six months of the year following. We have some large companies, perhaps the largest producers in the world, but they have never been able to control the well-defined laws of trade that make prices. We suspect that that practice in the East, which to us smacks a little of provincial assumption, will not survive long the newer and larger conditions now existing.

A. PLUEMER.—I have never been in favor of making contracts for monthly deliveries of an indefinite quantity, but have always insisted upon a stipulated amount, because the contract otherwise would be entirely in favor of the buyer and human nature would compel him to take the fullest advantage of such a one-sided contract offered him voluntarily by the manufacturer or his agent. The remedy for the evil of making contracts for delivery of pig-iron covering a period of from six to twelve months does not, in my opinion, rest altogether with the furnace men. It has been a rule for years with the sellers of ore and fuel to make their contracts with furnace men by the year. This being the case, why is it not a safe, conservative policy on the part of the furnace man to contract at least a portion of his output for as long a period as his ore and fuel contracts run? Of course he must make his contracts conditional upon the operation of his furnace and subject to strikes.

As far as freights are concerned, I am informed that railroads will protect rates on such contracts after having been duly notified. This would only leave the question of furnace labor. We all know that this is, comparatively speaking, a small item in the cost of making a ton of pig-iron and will fluctuate not to exceed 25 cents per ton in ordinary times. Let us take the other side, assuming the furnace man is compelled to contract for ore and fuel by the year and concludes not to make any contracts for monthly deliveries of pig-iron. While in case of an advance he would reap the benefit exclusively, provided his ore and fuel contracts were carried out, on the other hand, in case of a decline he would be the sole sufferer. Now let us take the position which the consumer of pig-iron occupies in this matter. He is compelled in most cases to make contracts with his customers by the year at a stipulated price. Before closing his contracts he naturally covers his wants by contracting for the necessary quantity of pig-iron. I admit that some consumers are able to purchase their yearly requirements for immediate delivery. Quite naturally this class expects to buy for less than the other. Their argument to the furnace man is: "We are ready to receive and pay at once for all the iron we want during the next twelve months. This means that on an average we will be out of our money six months, and the interest on it at 6 per cent. per annum on a basis of \$15 per ton is 45 cents per ton." The furnace man is politely asked to make a due allowance in submitting his proposition. In my humble opinion there is only one solution to this problem. That is, let the ore and fuel men, the furnace men and the consumers of pig-iron make their contracts on a sliding-scale. By taking the proper basis to start with it will insure to each a fair, legitimate profit, and this is all that anybody can ask, because these sudden fluctuations have as a rule worked detrimentally to the interest of manufacturers. How to establish and maintain a sliding-scale is certainly a question of the utmost importance and one to which I have given considerable reflection, but without reaching altogether satisfactory conclusions. I have

no doubt, however, that if the subject be made one for general discussion a feasible solution will eventually be found.

THOMAS G. SMITH.—I have always been opposed to the long-time contracts as unjust to the manufacturer. They were introduced here by parties who seemed rather to act in the interest of the purchaser than that of the manufacturer, and who in their anxiety to get into the business and secure trade made concessions which should not have been. I would be much pleased to co-operate in any action which may be taken looking toward the limitation of time contracts and securing the best interests of the manufacturer. I agree with you in your statements of the advantages to the purchasers by those long-time contracts without a corresponding advantage to the manufacturer. In my 35 years' experience in the pig-iron business I have always held as my first consideration the interest of the parties intrusting me with their business.

Pittsburgh.

We have the following letters from Pittsburgh firms:

I am not in favor of contracts extending over three months. I think that beyond that the transaction is merely speculative on the part of the consumer. It ties up the furnaces so that they cannot get the benefit of any advance. It is the fault of the furnaces entirely, for they should not sell in advance over three months. A wise management would not sell all the output even for that time. Why should it be done? since if iron goes up all benefit is lost, while if it declines some pretext will be found to get out. In my selling I never give the privilege of more or less; it is so many tons. Again, consumers wait till iron has touched the very lowest point, knowing that it cannot be produced for less; then they all want to buy for a year, and they get every dollar of improvement of the market while the furnace is struggling to get cost out of it. The furnace should not sell more than three months in advance, and sell only the exact number of tons, not 300 to 500 tons, but make it exact, either 300 tons or 500 tons. Instead of making one annual sale, as most of the Eastern furnaces do, have four sales per annum. Then they get part of the advantage of any advance. It is just as good for the consumer and makes both a very fair average for the year and hurts no one. If they treat all alike, it gives the smaller consumer a chance to compete.

I have always been strongly opposed to long-time contracts and am in full sympathy with any move that can be made to prevent the same. The only way to remedy this evil that I can see is for the producers to combine against it and stand together.

I do not think that any such contracts are made by sellers of pig-iron in this part of the country as are therein described, and any furnace man who would sell on such a basis would have only himself to thank for all the trouble which might follow. Our custom here is to make definite and specific sales only, and the contract is expected to be carried out whether the market goes up or down, and I am glad to say that it is a rare occurrence for either party to attempt to evade the terms agreed upon. Of course sales have to be made for future deliveries when necessary to cover contracts for finished iron, but in my opinion such deliveries should not extend over a longer period than three months. This is not excessive as an outside limit, especially when the greater part of one's output is sold on shorter time.

The practice of making such long-time contracts as you speak of is not nearly as prevalent in this market as it is in the East, and we therefore feel that our ex-

perience in the matter does not justify us in entering the discussion that you propose. We trust that your efforts in this direction may be profitable to the trade.

A firm having both Western and Eastern connections write:

I should say that the question of selling an indefinite quantity for long months, giving buyer the option of taking the maximum or the minimum amount, should not be made in any case, but under the present system of business do not think that the custom of selling fixed monthly deliveries for long time can be avoided unless there is some other method substituted for enabling manufacturers to "cover" on long-time contracts which they are obliged to make. Many consumers of pig-iron who deal with railroads, car companies, bridge manufacturers, steam-ship companies, and contractors who build bridges, steam-ships, public buildings, &c., must necessarily buy their raw material many months ahead or take the risk of the market, which might wipe out many times the profit in their contracts. Even if the majority of furnaces were to decide that they would not sell long contracts there would be a minority who would still sell their customers as they wanted to buy. Our experience has been that contracts for iron have been almost universally carried out by both buyers and sellers whether the market went up or down, but the long-delivery plan has been, on the average, against the interests of the sellers, as very few long-time buyers would purchase on a declining market, whereas many would purchase on an advancing market. It is therefore manifestly to the interest of furnaces to discontinue long-time-delivery sales as much as possible. The question is whether or not this is possible. Under the warrant system in Great Britain the manufacturers who make long-time contracts for rails, car-wheels, ships, bridges, &c., can cover their contracts, purchasing warrants for a corresponding period of time without going to the furnaces to make these purchases. Many furnaces in this country make long-time contracts partly because their customers insist on buying in this way and partly to insure the prompt disposition of their iron as it is made. Under the warrant system both of these reasons for long sale will disappear as soon as business becomes general. The furnaces, as soon as they become aware that their iron can be sold through warrants on the exchanges, at any hour can discontinue long sales and at the same time place their product, if desired, as fast as made. We do not think any combined effort to stop long-delivery sales is practicable under the old system, whereas under the warrant system the matter will regulate itself to the satisfaction of all parties concerned.

Philadelphia.

J. TATNALL LEA & Co.—All the contracts for pig-iron for future delivery that we have ever made have been for a definite amount, without any option to the buyer of taking a maximum or minimum amount, and therefore we have had no experience with that phase of sales for future delivery which you present in the first part of your letter. As for the general question of making long contracts for future delivery, we have, of course, at different times made many such contracts, some of which proved to be advantageous to the buyers and others to the sellers, as the case might be, but we have not, whatever the circumstances, except in insignificant cases, experienced any such serious difficulties in connection with long contracts as your letter seems to indicate have been experienced in some instances. Naturally, therefore, we do not regard the system of long contracts as an evil, have no remedy to suggest for it, but if we

had, we take it that no suggestion of ours or of others, even if generally indorsed by the trade, would work any change, as we believe buyers would continue to buy and sellers would continue to sell as their individual interests dictated, and if a seller considered it to his interests to make a long contract we believe he would have the effrontery to do so, whatever might be the policy pursued or action taken by the rest of the trade.

J. W. HOFFMAN & Co.—The points you urge against entering into engagements of this sort are entirely in accordance with our views, as we have never considered it conducive to harmony between seller and buyer to make deliveries under contract average very considerably above or below current rates at time of delivery. Such questions of dispute as you mention relating to quality and quantity are on a falling market frequently received without much ground or reason from the buyer. On the other hand, the seller if loaded up with low-priced contracts is very apt to help the average up by making sales, which gives the buyers cause for complaint on the ground of deferred deliveries when he rightfully had reason to expect promptness on the part of the seller.

We very much fear, however, that no concerted line of action which would be lived up to can be agreed upon, and that you will find that large furnaces and mills producing finished shapes of iron will be unwilling to restrict selling for future delivery to any limit other than such as their judgment of the market and their consideration of the customer making inquiry may dictate as being their particular policy. So far as the furnaces we represent are concerned, we have endeavored to follow the policy outlined in your letter and shall continue to do so, except when forced to make concession owing to the policy of our competitors.

A Philadelphia firm write: "In regard to selling pig-iron, especially American iron, we thoroughly agree with you and the manufacturers regarding the making of long contracts for future delivery, especially where there is an option clause. In fact, we have found it a bad custom in any case. As you say, should there be a falling market there is always a chance for the buyer to get out of taking the iron, and in many cases manufacturers will cancel their orders in order to keep a customer, and we find it a very unsatisfactory way of doing business. Should the market be the other way the seller alone is the loser, and it is one of those rules that will not work both ways. We cannot see why these long-time contracts cannot be done away with, and we really believe it would be a benefit to both parties. When we make long-time contracts we specify a regular monthly quantity with no option. This we only do in foreign material and we are loth to make a contract for over five or six months, as even this is speculative on the part of both buyers and sellers. While we do not feel justified in suggesting any new method, we should be very much pleased if through *The Iron Age* the long-time contracts would be done away with, although we cannot see why manufacturers would not be benefited by making contracts for a stated quantity for delivery over three months. This would not be speculative in any way, in our opinion, as manufacturers can almost always calculate about what the cost of their product will be during such a period."

Louisville.

A Louisville merchant writes: "There is considerable force in what the manufacturers say, and I believe that they are right. I feel quite confident myself that it would be much more satisfactory to both producers of pig-iron, consumers and the general trade to make contracts not to

exceed three to four months at the furthest; and I believe that the furnaces in this section as a general thing adhere to this rule, and in fact some will not sell over 60 days ahead. It is true that a large number of buyers, should the price of iron decline a dollar or two a ton during the life of their contract, complain that the iron does not come up to grade, make all kinds of excuses and complaints about the grading and in many cases want a reduction in price equal to the decline. But should the iron advance in price they are sure to claim every pound of it and have no sympathy whatever for the furnace men, not even when they know they are paying advances on ore, fuel, labor, &c. I would like to see the custom changed."

New York.

WARREN, WOOD & Co.—Concerning the allegation of the manufacturers that such contracts are too often of the nature of options, we should judge that deals of such a nature are confined almost entirely to Eastern Pennsylvania. In an experience of nearly 30 years in the pig-iron trade, we do not remember ever to have made a contract that was not entirely definite in quantity, in stated deliveries and in price, and we do not remember in all that time of more than one furnace man who has attempted to evade his contract, nor that more than two or three consumers have attempted to effect a cancellation for other than the best and most valid reasons. We have had a number of just such contracts on which we have been making regular deliveries during the very low prices of the past summer, and although in some instances the buyers could have duplicated their orders at fully \$2 a ton below the contract price, in not a single instance have they attempted to delay deliveries or to find any fault of any description. We do not see that there is any element of speculation in a contract of this character. The furnace men will make the iron and must sell it. The consumers simply buy to cover their actual wants, and at prices that will permit them a fair profit upon their finished work, much of which is sold at the time they place their orders for iron. The manufacturers of pig-iron in like manner contract for their ore and fuel for the year, and do not therefore take any risk of advance in either of these items. It is very rarely that the manufacturer will have sold more than one-quarter to one-half his prospective output, and any advance in labor or in freights is so nearly based upon the corresponding advance in the price of iron that the furnace men, with their one-half to three-quarters unsold output, are in position to take advantage of the advance of iron and thereby much more than counterbalance the difference. In our opinion it will be next to impossible to effect any marked change in the present methods of doing business. A very large proportion of the consumers do not care to buy for more than three to six months' supply; but others, among whom are the largest consumers in the country (notably the manufacturers of cast-iron water and gas pipe) are obliged to make contracts for large quantities of castings, frequently for delivery covering the entire year, and it is imperatively necessary for them to cover each of such contracts at the time it is made with a corresponding quantity of iron. As long as such conditions exist there must and will be found furnace men who are willing to contract for the required supply and for such deliveries as will relieve the consumer from the necessity of carrying at any one time an unnecessarily large stock.

L. & R. WISTER & Co.—Just who the leading manufacturers who spoke strongly in favor of changing the present methods are is the question or rather point upon which the custom hangs. The Thomas peo-

ple, who are the leading makers of foundry in this market, have generally named prices for a year ahead and have filled orders independently of the market meantime, except when it declined, in which event they have made concessions. In this way you will observe the customer has all to gain and nothing to lose.

In fully eight years out of ten the furnace has been the gainer. The policy is a shrewd one and has of course been well received by the customer. At times the small men have suffered severely by this policy, but we see absolutely no use in trying to take concerted action to overcome a condition of things which we have always opposed and which we have never fallen in with. Our principals are usually owners of single stacks, and sell on the market for one or two months' deliveries, but seldom for longer unless forced to. The force is always applied by the customer, who uses Thomas iron and one or two Southern companies as levers. There is no general feeling in the iron trade upon any subject. It has been tried in the tack interest with unfortunate results. The nail trade have had a close corporation, which is a rope of sand on prices. Pig-iron would be no better, as the interests of the various makers are diverse and their pockets generally depleted.

We think the suggestion as to how to overcome an evil should come from those who practice and keep it in force, rather than from those who have always opposed it in conversation and in deed.

When the Thomas Iron Company and others get hit hard enough they will stop it voluntarily, without outside suggestions.

* PERSONAL.

H. D. Hibbard, who for some time past has had charge of the melting department of the Linden Steel Company, has resigned, to take the management as superintendent of the Hainsworth Steel Company, the controlling interest in which was recently purchased by the Oliver & Roberts Wire Company.

H. Victor Gause, son of J. Taylor Gause, president of the Harlan & Hollingsworth Company, car and ship builders, of Wilmington, was thrown from his horse last week and seriously wounded.

Thorston Berg, who recently resigned his position as chief engineer at the Edgar Thomson Steel Works, has accepted a similar position at the Homestead Works of Carnegie, Phipps & Co., succeeding Mr. Aiken.

C. H. Zehnder, vice-president and general manager of the Jackson & Woodin Mfg. Company, of Berwick, Pa., has taken an office in the Equitable Building, New York, where he is usually to be found on Wednesdays and Thursdays of each week.

Another joint tariff on manufactured iron has just been issued by the Southern Railway and Steamship Association. The only change is that the rates to Atchison, Kan., Kansas City, Mo., Leavenworth, Kan., and St. Joseph, Mo., have been advanced from 43 to 45 cents per 100 pounds on less than carloads and from 34 to 35 cents in carloads from Birmingham and Chattanooga. An advance has also been made on the rates to Belleville, Ill., East St. Louis and St. Louis from 20 cents to 21 cents per 100 pounds on less than carloads, from 15 to 16 cents on carloads from Birmingham and 18 to 20 cents on less than carloads, and from 14 to 15 cents on carloads to the points named from Chattanooga.

The will of John H. Shoenberger, Pittsburgh's iron-master, who recently died in New York, provides, among other large

bequests, for \$800,000 for a Shoenberger memorial hospital to be erected in Pittsburgh, \$100,000 to the Protestant Episcopal Diocese of Pittsburgh and \$100,000 to Trinity Episcopal Church of that city.

The new Hamburg-American steamer Scandia, according to the statement of her skipper, is the most economical coal consumer afloat. She made the trip from Hamburg to Philadelphia, over 3000 miles, in 11 days, an average of over 11 knots an hour, burning only 58 tons of coal a day. The Scandia has only one screw, which sends her along in favorable weather at the rate of about 14 miles an hour. Her engines are of 3000 horse-power and of the triple-expansion type. She is 386 feet long, 44½ feet beam and 34 feet deep, and measures 2926 tons net.

Henry M. Stanley, the African explorer, who will soon arrive at Zanzibar with 750 followers, announces the discovery of an extension of Lake Victoria Nyanza, which makes its entire area 26,000 square miles, and this vast body of water is only 155 miles from Lake Tanganyika. Through the interior navigation thus brought to the knowledge of modern traders a very considerable portion of the most populous sections of the continent becomes accessible.

It has developed that an English syndicate has secured an option on very extensive thrashing-machine and other agricultural implement interests in Minnesota. The Minneapolis Thrashing Machine Company, with \$350,000 capital, are the most prominent one, and the other enterprises are the Minnesota Works, at Stillwater, the Aultman-Taylor Works, the Buffalo-Pitts Works, the Minnesota Harvester Works and others. If the deal goes through it is understood that the smaller outside works will be brought to Minneapolis and a stock company formed with over \$1,000,000 capital. The leading men of the city are interested in the Minneapolis Thrashing Machine Company, and they do not deny having signed an option for the disposal of their stock.

John W. Mason, Commissioner of Internal Revenue, has submitted to the Secretary of the Treasury a report of the operations of the Internal Revenue Service for the fiscal year ended June 30, 1889. The aggregate receipts for the last fiscal year were \$130,894,434, or \$6,567,958 more than the receipts for the previous year. The receipts for the first three months of the present fiscal year aggregated \$34,684,526, an increase of \$3,470,807 as compared with the receipts for the corresponding period of the last fiscal year. The Commissioner says that if this ratio of increase is maintained the receipts for the present fiscal year will amount to over \$142,000,000. He does not, however, think that such will be the case, and he estimates the collections for the current year at \$135,000,000.

The Southern Railway and Steamship Association have issued their second joint pig-iron tariff, taking effect on December 6. The new rates are on the basis of \$3.05 from the Birmingham and Anniston districts, \$2.55 from Chattanooga, \$2.80 from Sheffield, to Cincinnati. The Chicago rates are \$4.30 from the Birmingham district, \$4.05 from Chattanooga and Sheffield and \$4.55 from Anniston. The figures for St. Louis are \$3.55 from Birmingham \$3.30 from Chattanooga, \$3.10 from Sheffield and \$3.55 from Anniston. For Pittsburgh and Wheeling the rate is \$4.70 from Birmingham, \$4.20 from Chattanooga, \$4.45 from Sheffield and \$4.70 from Anniston.

MANUFACTURING.

Iron and Steel.

Furnace No. 1 of the Lehigh Iron Company, at Aineyville, Pa., has been blown out for repairs and No. 2 has been put in operation.

Another section of housings for the immense steam-hammer at the ordnance works of the Bethlehem Iron Company's plant, at Bethlehem, Pa., which required about 100 tons of metal, was cast on Monday, the 18th inst. The casting was under the supervision of Superintendent and Chief Engineer John Fritz and Michael Bitter, chief founder. The metal was melted in the cupolas of the converting department of the Bessemer plant and transferred in ladles placed on trucks drawn by narrow-gauge locomotives to place of casting. Preparations are also in progress for casting the anvil-blocks for the steam-hammer, which, it is said, will be the largest casting ever made in this country if not in the world.

The Cambridge Iron and Steel Company have commenced building their \$100,000 plant at Cambridge, Ohio. The product will be iron and steel sheets. A. Beard has taken charge during the construction and will be business manager when operations are commenced. Mr. Beard was for a long time connected with the Standard Iron Company, Bridgeport, Ohio. A. Beyer is president and W. C. Browne treasurer.

Bradlee & Co., Empire Chain Works, at Philadelphia, have just put in their shops a massive pair of shears, made by the Morgan Engineering Company, and capable of cutting 3-inch diameter iron. This enables them to now make the largest size cable-chain that will ever be required.

The blast-furnace of the Center Iron Company, at Bellefonte, Pa., was blown out on August 3 last for relining and repairs, and resumed operations on the 19th inst. The report that this property had recently changed hands is without foundation. One new puddling-furnace has recently been added to the puddling-mill of the firm.

The plant of the Paige Tube Company, at Warren, Ohio, is in successful operation, and will shortly go on double time. A meeting of the stockholders was held on Wednesday, the 20th inst., at which it was voted to increase the capital stock from \$200,000 to \$500,000. It is stated that a large rolling-mill will be added to the plant next summer. In one day recently there was turned out by the company 1025 pieces of 2-inch pipe 20 feet long, making more than 37 tons in weight, and the length of which would if laid out be four miles long.

The business community of Pittsburgh was startled last week by the announcement that Long & Co., proprietors of the Vulcan Forge and Iron Works, located in that city, had failed. The failure was precipitated by the suspension of the Lawrence Bank, the firm being heavy borrowers from that institution. In return for these loans Long & Co. had given the bank judgment-notes, which were foreclosed, and the plant of the firm is now in the hands of the sheriff. It comprises three departments—rolling-mill, forge department and machine-shop. In the mill department are 20 puddling-furnaces, 1 scrap and 3 heating furnaces and 3 trains of rolls. There are 4 hammers in the forge department and the machine-shop attachment is an extensive one. A meeting of the creditors of the firm will be held during the present week, at which a statement of their assets and liabilities will be read. It is the impression that an

arrangement will be made with the creditors that will permit the plant to continue in operation.

Stack No. 2 of the Reading Iron Company, at Reading, Pa., was put in blast on Monday, the 25th inst. Stack No. 1 of this firm was put in operation some time ago.

A recent issue of the Canadian *Manufacturer* says: "The by-law which provides for the granting of a bonus to the Belleville Rolling Mills Company, Belleville, Ont., and which will be submitted to the vote of the rate-payers on November 20, provides that a company shall be formed with a capital of at least \$50,000 for the establishment of a rolling-mill for the manufacture of bar and other kinds of iron or steel in Belleville. Upon the erection and completion of buildings and plant, at a cost of not less than \$40,000, with a capacity of 60 tons per day and the employment of at least 80 men in and about the works, the sum of \$12,000 shall be paid as a bonus and the sum of \$2600 per annum for the next five years, provided the number of men is increased to 250 by the end of that time, the increase to be not less than 20 per annum. The men shall all reside in Belleville and shall be employed for not less than ten months in each year. The works and plant shall be exempted from taxation for ten years, shall not be removed before the expiration of that period and shall be operated continuously, except in event of circumstances arising which the company cannot control."

James Cartwright, formerly of the firm of Cartwright, McCurdy & Co., of Youngstown, Ohio, and later engaged in the iron business at Aikanna, Ohio, has organized a company, known as the Seattle Rolling Mill Company, to erect and operate a rolling-mill at Seattle, Washington. The company have been incorporated, with a capital stock of \$100,000. The incorporators are James Cartwright, William Hainsworth, L. S. J. Hunt, H. E. Holmes, Bailey Gatzert, Jacob Furth, C. H. Noble, R. H. Boyle, A. P. Mitten, W. H. Llewellyn, S. L. Crawford, C. T. Conover and W. C. Hill.

F. W. Doty and W. E. Redway, of Toronto, Canada, were in Pittsburgh last week and placed orders for about \$75,000 worth of steel to be used in the construction of lake boats. Carnegie, Phipps & Co., Limited, obtained the largest part of the contracts.

Notices have been posted in the mills of the Glasgow Iron Company, at Pottstown, Pa., announcing an increase in the wages of the puddlers of 25 cents per ton. The men received \$3.50 per ton previous to the advance.

On Monday, the 18th inst., the papers were passed by which the Oliver & Roberts Wire Company, Limited, of Pittsburgh, secured five-sixths of the stock of the Hainsworth Steel Company, who own the Bessemer plant formerly operated by the Pittsburgh Steel Casting Company when William Hainsworth was superintendent. The other one-sixth is owned by Wm. T. Sanger, who, with the Oliver concern, will operate the Bessemer plant. The Oliver & Roberts Wire Company, Limited, use between 3500 and 4000 tons of steel billets every month in their rod-mill, which they have purchased in the open market. In the future this will be made by the firm and they will probably have some to sell. The present capacity of the plant is about 5000 tons per month. The purchasers will make extensive improvements which will largely increase the capacity.

In a letter to the *Sheffield Enterprise* Edward Doud, superintendent of the Lady Ensley Furnace Company, reports that the consumption of materials per ton of 2300

pounds of pig-iron is 2013 pounds of coke, 4490 pounds of ore and 1115 pounds of limestone. The production is given as 156½ tons a day. The two blowing-engines have 84-inch cylinders, 4-foot stroke and make 27½ revolutions.

It is reported that the new rod-mill of the American Wire Company, Cleveland, Ohio, built by C. Morgan, is making from 75 to 80 tons of No. 9 rods per day, direct from 4-inch 200-pound billets.

The Ohio Valley Steel Company is the name of a newly incorporated company with a capital of \$400,000 that has been incorporated in Cincinnati for the purpose of manufacturing steel wire, wire nails and barb-wire. The principal incorporators are the members of H. Belmer & Co. and the Cincinnati Barb Wire Fence Company, together with a number of capitalists. The new company have had plans made and propositions are being received for machinery, &c., for a rod-mill of the most approved construction, and operations will be commenced at an early date.

The Cobb rolling-mill and nail factory at Aurora, Ind., has been dismantled. The machinery has been sold by the receiver in separate lots to different parties.

The product of the new steel plant to be built by A. C. Isaacs and others at Greensburg, Pa., to make steel by the Isaacs process, will not, as reported, be marketed at lower figures than those usually obtained for high-class steels. S. U. Boucher, of Pittsburgh, informs us that the parties interested anticipate that they will secure high prices.

It is reported that a contract has been closed for the building of a charcoal furnace at Rome, Ga. L. S. Colyar and others, of Chattanooga, are interested.

The Roanoke Iron Company, at Roanoke, Va., have let contracts as follows: To McClure & Ainslie, of Pittsburgh, Pa., to erect the furnace, to be 17 feet by 82 feet, 4 hot-blast stoves each 18 feet in diameter and 60 feet high, and 14 steam-boilers 5½ feet in diameter and 30 feet long; to the Robinson-Rea Mfg. Company, of Pittsburgh, Pa., for furnishing 2 upright blast-engines with 84-inch blast cylinder and 42-inch steam-cylinder, and to the Wilson-Snyder Mfg. Company, also of Pittsburgh, 6 improved pumps. The contract for the cast-house and boiler-house has been let to the American Bridge and Iron Company.

Machinery.

R. Munroe & Son, proprietors of the West Point Boiler Works, at Pittsburgh, shipped last week from their factory a wood-pulp mill that is one of the largest made in this country. It is shaped like a boiler, about 8 feet in diameter by 30 feet in length. The heaviest boiler-plate iron was used in its construction, and it weighs close to 20 tons. It will be put up in a paper-mill near Piedmont, W. Va.

The Long & Allstatter Company, Hamilton, Ohio, are adding a story to their main building. The building is 60 x 200, and the improvement will make it four stories high.

We are in receipt of the catalogue for 1889 of the Ottumwa Iron Works, of Ottumwa, Iowa. This catalogue refers especially to coal-mining machinery, although, of course, the hoisting-engines and general machinery manufactured by the company are adapted to other mining operations. The illustrations and descriptions in the catalogue cover a great variety of hoisting-engines, both double, reversible and single, also hauling-engines, the Ramsay coal-distributor, ventilating-fans, &c. The company make a specialty of the tail-rope system of under-ground haulage and are prepared to contract for machinery for plants

complete and to guarantee results. They build their own engines, coal-cars, fans, screens, quarry-hoists, &c. Their manufactures also include pulleys, shafting, gearing and other mill supplies. The concluding pages of the catalogue embrace a number of lists of interest to dealers in and users of machinery.

The Bethlehem Foundry and Machine Company, of Bethlehem, Pa., report that the orders for Archer gas-fuel plants will keep the works running for some time. They have recently shipped a plant to the steel-works at Johnstown, Pa.

The Westinghouse Machine Company are engaged in putting an electric-light plant into their establishment so arranged and of such capacity as will make these works (if such a thing be possible) as light by night as they are by day. A combination of incandescent and arc lights will be used for the purpose. The former will be effectually distributed over the whole area of each department, and these will be supplemented with arc lights in all large spaces. The company are adding a complete force of night workmen, and as it is believed these workmen will henceforth here find continuous employment, it becomes important that the establishment shall have a permanent, abundant supply of light. If each machine is lighted independently it is found that workmen cannot move about the shops to advantage in the gloom, and, in short, cannot do as much work as the same force would by day. A reduction in product of only 2 per cent. on a large force is important, and to save this on a night force is well worth the cost of maintaining a brilliant, abundant, general illumination of the establishment, if it can successfully be done. The sales last month were the largest ever made by the company; they were 110 engines, aggregating 6035 horse-power.

Follansbee Machine Company, Bridgeport, Conn., have recently completed a number of complicated automatic machines for the United States lock shop at Washington, which are to be used for making milled pins for the locks used on mail-bags. They are also engaged on machines for making staples for mail-bags and other special work, for which they have excellent facilities.

E. E. Garvin & Co., of this city, have transferred all their right, title and interest to the Garvin Machine Company, who will continue the extensive business in the building of machine tools established by the old firm.

The Hall Steam Pump Company are now located in their new works at Pittsburgh. The main building is 60 x 250 feet, of brick and iron, built especially to suit the requirements of a first-class machine-shop. Connected with it is the brass and iron foundry. At considerable distance from the machine-shops is another fire-proof building for the storage of patterns, &c. All are located on a large plot of ground, giving ample yard-room. Every department is fully equipped with new machinery of the best make, with numerous special tools designed to turn work out rapidly, economically and well, and with competent men of experience in charge.

Hardware.

The Chicago Spring Butt Company, whose offices and factory are now at 154 and 156 West Lake street, are making preparations to move into their new factory building, located at the northwest corner of Carroll avenue and Union Park place. This is a five-story and basement building, of mill construction, 50 x 123 feet, with pressed-brick and stone front and pressed-brick arches to all the openings on the side. It will be equipped with an 85 horse-power Corliss engine, two 50 horse-power boilers and the latest and

most approved system of rope-transmission of the power from the basement to the fifth story. It will have an Eaton & Prince automatic-action elevator, with the Chenoweth patent fire-doors; also a stand-pipe and fire-ladder, with stair-ways front and rear, making an easy and sure exit in case of fire. The first floor and basement will be provided with large vaults, suitable for storing patterns and special home-made tools which would not easily be replaced when destroyed. Each floor will have its own toilet conveniences, of the most improved pattern. The entire building will be heated by the hot-blast system. The first floor will be occupied principally for office purposes, arranged in a most unique but convenient manner, with electric calls and lights. The building is constructed very substantially throughout.

Brand Mfg. Company, New Britain, Conn., have reorganized and changed their name to the New Britain Hardware Mfg. Company and increased their capital stock to \$50,000. They will continue the manufacture of piano and organ hardware and light metallic goods and add a department for making special machine screws, studs, &c. New machinery is being put in and the plant rearranged to increase the capacity in former lines and meet the demand for the departure. W. H. Hart is president and T. W. Wilbor treasurer.

The Comstock & Wing Nickel Works are erecting a six-story brick factory, 95 x 50 feet, at Carroll avenue and Sangamon street, Chicago. They are at present occupying quarters at 95 and 97 Indiana street, where they will be located until their new factory is completed. The company have purchased the entire plant of the Superior Nickel Works, at 125 and 127 Indiana street, and are operating it in addition to their old plant. They now have at work some 80 polishers, which they claim to be the largest polishing force in the West and one of the largest in the country. On the 25th of last month they also purchased the business of C. H. Haycock, manufacturer of hardware specialties, at 84 South Market street, Chicago, and will continue the manufacture of the line of goods made by him, such as corkscrews, nut-crackers, ice-shaves, box-hooks, &c. Mr. Haycock has entered the employ of the company and is thus giving them the benefit of his experience in manufacturing the goods, as well as of his acquaintance in the trade. The Comstock & Wing Nickel Works pay special attention to the needs of stove manufacturers, having very fine facilities for nickel-plating. They are now so situated that they can turn out all work very promptly which may be placed with them. In addition to their other articles, they are manufacturing a line of stove trimmings, knobs, hinge-pins, turn-buckles, towel-rods, poker, &c. The miscellaneous goods which they manufacture include curling-irons, tracing-wheels, toy safes, &c. They also do a considerable trade for bicycle manufacturers in the line of polishing and plating. A catalogue of their goods is now being prepared, which will shortly be ready for distribution. The officers of the company are as follows: J. J. Comstock, president; P. G. Wing, vice-president and superintendent; John A. Comstock, secretary and treasurer.

E. Covert Mfg. Company, Farmer Village, N. Y., report that their trade for 1889 exceeds in amount that of previous years and the prospects for 1890 are referred to as very encouraging. They have orders already to supply some of the best and largest manufacturers with neck yokes during the coming season and are making preparations to enlarge their plant to nearly double their present capacity. They have just added to their tumbling-

room a new style of all-iron tumbling-barrel of 2000 pounds capacity.

Miscellaneous.

The Ohio Falls Car Company, of Jeffersonville, Ind., have closed a contract with the Central Railroad Company of Georgia which calls for 1200 freight-cars and 22 couch, baggage, mail and express cars.

The Jeffrey Mfg. Company, of Columbus, Ohio, report a brisk business in the line of chain-belt, and now have under process of erection several large plants. The demand for their several styles of chain-belt continues unabated.

The National Pulley Covering Company, of Baltimore, wish to correct the impression that their covering is composed of paper or cloth and applied in layers. On the contrary, it is furnished in one piece enough longer than the circumference of the pulley to make a lap, can be applied without removing the belt or using a rivet and is composed of material whose frictional resistance is greater than anything known and cannot wear smooth.

Baker Chain and Wagon Iron Mfg. Company, Allegheny, Pa., have taken one of the largest private orders ever placed in this country for ship cables. It is an order for cable for 14 lake vessels now building on Lake Erie.

Among the new corporations in Illinois are the following: Chicago Spring Company, at Chicago; to manufacture wagon and carriage springs; capital stock, \$40,000; incorporators, James Plumstead, G. H. Jones and Charles A. Kimbark. The English-Eaton Hardware Company, at Jerseyville; for mercantile business; capital stock, \$15,000; incorporators, G. M. Eaton, J. N. English and J. H. Crawford. The Mechanics' Foundry Company, at Chicago; to do a general foundry and machine business; capital stock, \$10,000; incorporators, Thomas Hoyer, B. M. Pettingill, C. W. F. Webber. The Lone Star Cotton-Picking Machine Company, at Chicago; to manufacture cotton-picking devices; capital stock, \$5,000,000; incorporators, Adelbert Matteson, F. J. Lumley and W. M. Brandt. The Tasker Steel Tube Company, at Chicago; for manufacturing merchantable steel and boilers; capital stock \$500,000; incorporators, W. S. Morse, G. B. Lathrop, O. B. Petters. The Daisy Mfg. Company, at Chicago; to manufacture hardware; capital stock, \$250,000; incorporators, George Kelly, G. W. Ball, W. G. Goldner.

The Queen and Crescent Route via the Alabama Great Southern and the Cincinnati Southern Railway has issued a rate-sheet on pig-iron, which goes into effect on November 28. It covers shipments from the Tennessee and Georgia furnaces and from those in the Birmingham, Sheffield and Anniston districts, Alabama, to points North, East and West. The rate is \$3.51 from Dayton and Rockwood and \$3.86 from the Alabama coke furnaces to Harrisburg, Pa. It is \$3.90 from Dayton and Rockwood, \$4 from Rising Fawn, and \$4.45 from Trussville to New York and Philadelphia.

F. L. Alcott has been appointed the salaried commissioner of the forge combination. The other officers are: President, L. M. Coe, vice-president and general manager of the Cleveland City Forge Company; vice-president, W. S. Sizer, Buffalo; Executive Committee, Mr. Howard, of Buffalo, D. S. Bissell, of Pittsburgh, W. F. Pinkham, of Whitestone, L. I., C. D. Beckwith, of Paterson, N. J., and R. A. Harman, assistant general manager of the Cleveland Company.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, November 25, 1889.

Pig-Iron.—Large buyers have succeeded in placing contracts for round lots of local Coke Iron to be delivered during the first half of next year, notwithstanding the reluctance of manufacturers to enter into such engagements. They were obliged to pay a slight advance on previous prices, however, and it now looks as though other buyers will have to pay a still greater advance. The ball having been opened for next year's business, an active demand is expected from those who are in the habit of anticipating their requirements. Southern Coke Iron is to be had in small lots only, and that through dealers who have secured a supply from second hands, the furnace companies themselves being almost universally out of the market. Ohio Irons are selling quite freely in small quantities. The advance in this market has brought out several brands which had for a time been absent from it, such as Indiana Coke and Missouri Charcoal. Lake Superior Charcoal has been in better demand, and at least one heavy consumer has bought largely. Speculative inquiries promise to strengthen the market considerably for this class of Iron, which is no longer to be had at \$20. Quotations are as follows, for cash, f.o.b. Chicago: Local Coke Foundry, No. 1, \$18.50 @ \$19; No. 2, \$17.50 @ \$18; No. 3, \$17 @ \$17.50; Bessemer, \$22; Lake Superior Charcoal, \$20.50 @ \$21; American Scotch (Blackband), No. 1, \$20.50 @ \$20.75; Ohio Silveries, No. 1, \$18.75 @ \$19.25; Southern Coke, No. 1, \$18.50 @ \$19; Standard Alabama Car-Wheel, \$25.50 @ \$26.50.

Bar-Iron.—The volume of business is heavy, with a continued good outlook. Indications of a speculative tendency among some classes of buyers are apparent. Prices on carload lots from mill are now firm at 1.90¢ @ 1.95¢, Chicago, for Common Iron, with usual half extras. Norway or Swedish Iron from store is now quoted at 3.75¢ in a regular way, an advance of \$13 ¢ ton having been made in the cost of this Iron in the past four months.

Structural Iron.—Angles and Tees are moving quite freely, but there is a decided falling off in the demand for Beams and other structural shapes.

Plates, Tubes, &c.—The past week has been rather quiet. Boiler-makers and other heavy consumers of Plates are so full of work that their facilities are taxed; hence they will make no new purchases of material until they begin to see daylight.

Sheet-Iron.—Mill agents report their present business confined to sort-up orders from jobbers and an occasional order from agricultural implement manufacturers. They quote 3.15¢ @ 3.20¢ at mill for No. 27, according to delivery. Galvanized Iron is being received more plentifully from the mills, while the demand continues heavy. Small lots are quoted at 50 and 10 % off for Juniata.

Merchant Steel.—The season is now at hand when dullness is to be expected, but for the present the demand is quite good while prices are very firm, although as yet all manufacturers have not advanced their rates to those named by the leading houses. Steel Billets are in demand and are quoted at \$36 @ \$36.50.

Steel Rails.—The sales of the past week amounted to only a few thousand tons. Among them are included some orders taken by mills in Western Pennsylvania for January and February delivery

at \$35 at mill. Local prices are strong, and it is intimated that \$37 will be asked on further business.

Track Supplies.—Quite a number of orders have been in the market since our last report, and buyers found that prices were decidedly firmer, some of the leading manufacturers having so much work on hand that they refuse to quote at present for next year's deliveries. Quotations are as follows, Chicago: Soft Steel Splice-Bars, 2.25¢ @ 2.35¢; Iron do., 2¢ @ 2.05¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.90¢ @ 3¢; Hexagon do., 3.05¢ @ 3.15¢.

Old Rails and Wheels.—Old Iron Rails continue scarce and are very stiff at \$26 @ \$26.50. Old Steel Rails are quite active, bringing \$20 @ \$21, according to length and selection. A sale of 1000 tons of Old Steel Rails from Canada was made at \$20, delivered at Buffalo, the lot including long and short pieces, Guards, Frogs, &c. Old Car-Wheels have begun to move. Several hundred tons were sold at \$19 and larger quantities at \$19.50.

Scrap.—A reviving demand is noted for Wrought, and low grades are also receiving more attention, with the natural result of advancing prices.

Hardware.—Jobbers in Shelf Hardware are still pressed with orders and no signs of checking up are visible as yet. In some lines business is even increasing, although the volume of sales for the month will hardly be up to the phenomenal trade of October. Jobbers of Heavy Hardware are also doing a rushing business, the demand for Wagon stock being especially heavy.

Nails.—In this immediate vicinity dealers are now well stocked to the 1st of January with Cut Steel Nails. Some desire to contract for later deliveries, but manufacturers are not ready to make prices. A demand is noted from the Pacific Coast, where the heavy trade appears to have had little faith in the predicted advance of prices when Nails were selling at low rates, and are consequently obliged to purchase now without regard to cost. Manufacturers' agents continue to quote \$2.25, at factory, for specifications averaging 25¢ above base. Small lots from stock are quoted at \$2.50. Wire Nails are active, with manufacturers' agents quoting \$3, at factory, except in the case of a large concern which recently re-entered the market and offered their output at a slight concession to secure heavy orders. Jobbers quote small lots \$3.15 from stock.

Barb-Wire.—The demand is increasing to such an extent that the prospects are now strongly in favor of higher prices, without regard to the operations of the Federal Steel Company. Small lots are available for the present at 3.25¢ for Painted, and carload lots at 3.15¢, with Galvanized quoted at 60¢ ¢ 100 lb advance.

Pig-Lead.—The local market is reported to have improved during the week, with sales of over 700 tons of Desilverized and Chemical Lead at about 3.65¢. At the close sellers were firm at those figures.

Cleveland.

CLEVELAND, November 25, 1889.

Iron Ore.—There is an excellent demand for Ore of every grade and 250,000 tons could easily be sold at an advance of 75¢ ¢ ton over midsummer prices if the Ore could be produced. The mine-owners are not seriously objecting to a \$1.05 @ \$1.10 rate from Escanaba for the final trips of the season. Navigation will be at an end before the beginning of another week and the totals for 1889 will soon thereafter be computed. The shipments from the Lake Superior district to date closely approx-

imate 6,700,000 tons and the all-rail shipments to follow will bring the total to about 7,150,000 tons, an increase of 2,200,000 tons over last year's output. During the week just closed several season contracts for carrying Ore have been made for 1890 at the rate of \$1.05 from Escanaba, \$1.20 from Marquette and \$1.35 from Ashland and Two Harbors. This is an unusual proceeding and seems to indicate an early opening of next season's market. The opinion is expressed among Ore men that the close of the season will witness less than 100,000 tons of unsold Ore upon the docks at lower lake ports.

Pig-Iron.—Mill Irons are in great favor, \$16.30 @ \$16.80 being paid for Neutral and \$16.80 @ \$17.30 for Red Short, cash, at the furnaces. Bessemer of all grades is demanded from almost every quarter at prices continually growing more favorable to the sellers. There has been no decisive changes in quotations during the past week, although prices for Bessemer, Gray Forge, Foundry and Mill Irons are remarkably firm, with a decided upward tendency. This active demand all along the line so near the close of the year, when business is often dull, encourages the furnace men in the belief that a good market for all the Iron they can produce for the first six months of 1890 is assured.

Scrap-Iron.—Old American Rails are still eagerly inquired for at \$26.50 and selected Axles are also in favor at \$27.

Manufactured Iron.—Common Bar continues to command 1.75¢ @ 1.80¢. Sheets are almost impossible to obtain at any price.

The Schlessinger Syndicate have now purchased outright the Buffalo, South Buffalo, Queen and Prince of Wales Ore mines in the Marquette range for \$755,000. The syndicate has already secured possession of the Youngstown, Florence, Iron River, Chapin, Armania and Dunn mines in the Menominee range. The total output of all these mines in 1889 exceeded 1,300,000 tons.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, November 25, 1889.

Pig-Iron.—The conditions remain unchanged. There is no Southern Iron being sold in this market, for the reasons explained in last week's report—i. e., speculators having gone into the market and advanced prices from \$1.50 to \$2 ¢ ton. There have been a few sales of Missouri Iron, but only in small lots. The country trade, who have been more or less credulous in regard to the legitimacy of the recent advances and who regulated their purchases accordingly, find themselves with but little Iron on hand, and will shortly be compelled to come into the market for supplies. Furnaces are all sold up to January 1, and many have booked contracts for delivery extending into February and March of next year. In the absence of sales prices a repurly nominal and are given merely to show the St. Louis delivered prices on the basis on which sales are being made in the Southern markets, as follows:

Southern Coke, No. 1 Foundry,	@ \$19.00
Southern Coke, No. 2 Foundry,	@ 18.50
Southern Coke, No. 3 Foundry,	@ 18.00
Gray Forge,	@ 17.50
Ohio Softeners,	@ \$19.00 @ 19.50
Lake Superior Charcoal,	22.00 @ 23.00

Missouri.	
Charcoal Foundry, No. 1,	18.50 @ 19.00
Charcoal Foundry, No. 2,	17.50 @ 18.00

Tennessee.	
Charcoal Foundry, No. 1,	18.50 @ 19.00
Charcoal Foundry, No. 2,	17.50 @ 18.00
Connellsville Coke, f.o.b. East St. Louis,	\$5.25; St. Louis, \$5.40.

Bar-Iron.—Demand continues good and jobbers are enjoying a lucrative trade.

The railroads are placing their orders, and mills have enough Iron booked to keep them employed for two months to come without an additional order. Prices show no disposition toward weakness, but on the contrary are being strictly adhered to, as follows: Lots from mill at 1.92½¢, f.o.b. East St. Louis. Small lots from store command 2.10¢.

Barb-Wire.—Trade continues to hold up fairly well, and the outlook for a large business after January 1 is very encouraging. At this period of the year, when trade is naturally restricted, prices are liable to be shaded to keep the mills employed, and if the next six weeks can be successfully bridged over without any serious break in prices (which is quite probable) it is only reasonable to assume that higher prices will rule after that time. For the present the prices we have been quoting for some weeks past are still ruling, as follows: Painted, from 3.20¢ to 3.25¢; Galvanized, from 3.80¢ to 3.85¢; Carload lots, 10¢ per 100 lb less than above prices.

Financial.

The most cheering feature of the week is the exhibit of the foreign trade of the United States for October as given by the official returns, the exports having exceeded \$100,000,000, a circumstance not paralleled before in any single month during the last ten years. The imports, too, are large, and are noticeable as indicating a growing tendency to concentrate at the port of New York. The returns at New York showed an increase in the receipt of foreign merchandise for the month of October of about \$3,500,000 over the corresponding month of 1888, but there has been a decrease at the other ports amounting in the aggregate to \$2,684,953, so that the total increase for the whole country during the month is only \$904,393. Exports and imports compare as follows for the entire country:

	1888.	1889.
Exports of produce and merchandise.....	\$74,720,389	\$97,669,417
Exports of specie and bullion.....	3,566,274	6,370,627
Total exports in October.....	\$78,286,663	\$104,040,044
Imports of merchandise.....	\$66,259,522	\$68,127,529
Imports of specie and bullion.....	3,314,961	2,451,347
Total imports for October.....	\$69,574,483	\$70,578,876
Balance of trade.....	\$8,612,180	\$33,461,168

For ten months the comparison is as follows:

	1888.	1889.
Total exports, ten months.....	\$574,543,186	\$719,421,449
Total imports, ten months.....	\$631,046,388	\$675,114,603
Balance of trade.....	\$56,500,302	\$44,306,846

The change is upward of \$100,000,000—that is, from an adverse balance of over \$56,000,000 to a favorable balance of over \$44,000,000 is all on account of increased exports. It is also to be noticed that in the outward movement produce is of late substituted for specie.

The stock markets were dull and irregular. Cotton-Oil was in demand on the announcement that certificates had been deposited in sufficient amount to assure the reorganization, which takes place December 2. On Monday transactions in Atchison constituted more than a fourth of all the dealings in regularly listed stocks. Atchinson and Rock Island were both favorably affected by news that these roads have formed an offensive and defensive alliance for transcontinental traffic similar to that made some weeks ago between the Northwestern and the Union Pacific.

The forthcoming report of the Comptroller of the Currency for the year ending October, 1889, is of special interest with

reference to future bank circulation. At the date named there was in existence 3319 national banks, the largest number in operation since the inauguration of the system. These associations possess an aggregate capital of \$620,174,365. The amount of circulation outstanding was \$203,662,732, of which \$131,383,334 was secured by United States bonds and the remainder, \$72,279,398, was represented by deposit of lawful money in the Treasury. These banks held \$194,972,900 in United States bonds (of which \$146,471,700 were to secure circulating-notes), \$164,326,449 of specie and \$86,752,093 of legal tender notes. Within the year 211 banks were organized, having an aggregate capital of \$21,240,000. Notwithstanding this increase the system has not kept pace with the necessities of the people for increased banking facilities. This is evidenced by the marked increase in percentage of State banks. This growing tendency to incorporate under the laws of the several States is chargeable directly to the fact that no profit results to the banks by reason of the deposit of bonds and issue of circulating-notes. Attention is called to the fact that of the 4148 associations which have entered the system only 130 have become insolvent, or about 3.13 per cent. Statistics are introduced to prove that the per cent. of losses by reason of failures of State banks are greatly in excess of those above quoted. Congress is asked to preserve a system which has worked so admirably. Of the \$146,471,700 United States bonds held as security for the circulation of National banks on September 30, \$51,174,417 is in excess of the minimum requirements. This excess on October 4, 1888, was \$79,879,220, showing a decrease during the past twelve months of \$28,704,803. It is deemed certain that this withdrawal of bonds held in excess of the minimum requirements will continue so long as the present conditions exist, and it is asserted that legislation is necessary to prevent a contraction of the volume of national bank currency. Taking as a basis of computation the capital stock as it appears in the summary of reports for September 30, 1889, the present minimum of deposit of bonds is found to be \$95,297,283. If the law is amended as proposed the minimum of bond deposit required will be reduced to \$43,891,581, making possible a withdrawal of \$51,405,702 in bonds, upon which is based \$46,265,132 in circulating-notes. It is claimed that this would greatly exceed the limit of probable contraction, it being fair to presume that the banks now maintaining a deposit in excess of legal requirements would not withdraw the bonds thus released.

United States Bonds are quoted as follows:

U. S. 4½s, 1891, registered.....	104½
U. S. 4½s, 1891, coupon.....	105½
U. S. 4s, 1907, registered.....	127
U. S. 4s, 1907, coupon.....	127
U. S. currency 6s.....	117½

The Secretary of the Treasury accepted \$216,500 4s at 127, \$10,000 4½s at 105½ and \$5050 do. at 105½.

The general merchandise markets are quiet, some effect being apparent from the closing of water routes. Coffee is well sustained, though there is less inquiry for first hands supplies. Sugars show a steady gain in values and a good demand. Spot cotton is slow and unchanged. In wheat there was a break, and in breadstuffs there is an easier feeling. Both the English and French markets have been eager buyers of oats. Corn is up a shade, on account of export business. Para rubber is firm at 74¢ @ 76¢ for new.

The bank statement shows a gain in reserve of \$935,325, which brings the surplus up to \$1,485,200 above legal requirements. During the week there was a decrease in loans of \$607,300, a liquidation

in deposits of \$3,292,900 and a gain in cash of \$112,100. The banks lost something like \$1,500,000 through shipments of currency to the West, but gained \$1,400,000 on account of the Sub-Treasury operations.

The money market has been more or less influenced by the silver situation and reports respecting the possible withdrawal of Government deposits from our local banks, which latter proved to have no real foundation. The result was a tendency for higher rates, averaging about 6% for loans, some of the banks and trust companies taking all they could get. Time money for 60 days was hard to obtain at any rate, although 6% and 7% was bid. Five, six and seven months loans were made at 6% to 7%, but the lenders dictated the time and insisted upon engagements for the longest date. No quotation was made for loans on good mixed security. Quotations for commercial paper were only nominal and in every instance the rates were exceeded. Collections are good. Much interest will attach to the proceedings of the St. Louis Silver Convention, which assembled on Tuesday, with about 350 delegates. The effects of demonetizing silver and of unlimited coinage will be special topics. Of late the price of silver has steadily advanced until it is now quoted in London at 44d, or about 95½ cents, an ounce, largely due to the improvement of trade in India. Sterling is steady at \$4.81½ @ \$4.86.

Coal Market.

Representatives of the Coal companies are experiencing what is professionally known as a "thermometer market," and accordingly are directing attention to the approaching cold wave. A low temperature is now the only dependence in looking for "snap" in the trade. Up to the present time there has been no relief from the prevailing dullness, although it is admitted that a large amount of Coal has passed into consumption. There is disappointment only in the comparison with the enormous business of last year. The official statement shows that during October the stock of Coal at tide-water decreased 172,000 tons. The productions meanwhile was 3,711,870, exceeding the allotment about 700,000 tons, but 475,000, less than for the corresponding month last year—hence the dissatisfaction. Storms have seriously interrupted Coal transportation during the last few days, as well as Coal mining. The Reading Company were unable to ship any Coal to the North and West via their usual connections owing to the damage to the Fall Brook and Beech Creek railroads, and coastwise shipments from the mines were mainly by water routes on account of the pressure of freight via the Pennsylvania and Baltimore and Ohio railroads. Reading report for the week 33,000 tons sent to Port Richmond and 22,000 to Port Liberty.

Mayor Grant received a communication signed by a large number of wholesale Coal-dealers asking him to veto the resolution passed by the Board of Aldermen licensing "Coal freight-scalpers."

Respecting prices, sales agents quote only the schedule, but individuals are selling at about \$4.15, f.o.b.

Bituminous Coal is quoted at pool prices, but spot is higher on account of short supplies.

Contracts for the construction of 2000 new Coal-cars were let last week by the Lehigh Valley Railroad Company to builders along the line of that road. The cars will all be eight-wheeled, and of the strongest and most durable pattern.

A Reading dispatch says the line of the new Philadelphia, Poughkeepsie and Boston Railroad will be extended southward from Slatington to Harrisburg, where it can make through connections with all the

various branches and leased roads of the Pennsylvania system.

The Central Railroad of New Jersey have commenced to run freight and Coal trains from Phillipsburg to Belvidere, N. J., over the Pennsylvania and thence over the Lehigh and Hudson River road to the Poughkeepsie Bridge.

Andrew Carnegie has commenced the construction of a road from Bessemer direct to the coke regions.

The Lykens Valley Company mined 30,907 tons of Coal in October. The net profit per ton on sales in October was 61¢, against 12¢ last year, and the average net profit per ton for ten months has been 5¢, against a net loss per ton last year of 12¢.

Metal Market.

Copper.—Since our last week's report spot Copper advanced in the London market from £47. 15/ to £49. 2/6 and futures from £48 to £49; sales, 3300 tons. The active consumptive demand continuing in our own market has continued hardening, the quotation for Lake being 13½¢ @ 13¼¢, and for casting brands 11¼¢ @ 12¢. Lake Copper closes firm to-day at 13¼¢ asked. A fire broke out in the St. Lawrence Mine, Montana, on the 24th inst., adjoining the Anaconda. It was stated that the shaft of the Anaconda is bulk-headed, and that neither smoke nor gas issue from it, and that all the levels of the St. Lawrence being bulk-headed no draft of air can get in, depriving the fire of air to fan it. It was believed that the carbonic acid gas that would necessarily be generated would eventually extinguish it. It was not yet ascertained whether the fire had extended to the workings of the Anaconda or not. The two mines are practically one, being connected in all their levels from the 200-foot of the Anaconda down. About the changes in value of Copper stocks in the Boston market the following statement has been received from that city: "There are 35 Copper stocks listed on the Boston Stock Exchange, of which only eight pay dividends. Just before the French Copper syndicate came on the field in the fall of 1887, the market value of these eight companies, based on the prices of their stocks applied to the total number of shares outstanding, aggregated \$28,000,000. The result of the syndicate operations was an increase in the market value of the eight companies to \$55,000,000. The collapse of the syndicate caused a decline to \$29,500,000, and the recent improvement in the Copper situation has caused a rise to \$40,000,000. The eight companies are the Calumet and Hecla, the Tamarack, the Boston and Montana, the Quincy, the Franklin, the Atlantic, the Osceola and the Central." In their semi-monthly report of November 16 Messrs. James Lewis & Son, Liverpool, express themselves about the improvement as follows: "This sudden movement in the Copper market is due to the sanguine feeling arising from the great advance in the value of Iron and the large consumptive demand for this metal, which induces a belief that if the large stocks of Iron which lately existed can be reduced to the extent they have been the same will apply to the large stocks of Copper. Commencing with speculative purchases on Scotch and English account, these have been followed by large purchases on German account, the French and other holders, as well as previous purchasers, realizing. Most of the sales made have been with three and six months' prompt, as cash sales to the same extent would have had a depressing effect and revealed who the actual sellers were. A considerable quantity of Chili Copper for forward delivery has been sold on account of Chili producers at the advance,

a good deal of Copper being held there." The import of American copper into Liverpool and Swansea from January 1 to November 16 has been 25,756 tons Fine, against 21,465 tons during the corresponding period of last year and 12,864 in 1887. A Hamburg stock company have bought the Hollenthal Copper Mines in the Meissner Mountains, in the Electorate of Hesse, Germany, which had lain idle since 1850, and they have now commenced sinking new shafts. The export of Pyrites from Spain during the first nine months has been 624,810 tons, against 629,600 tons last year and 594,779 in 1887; of Precipitate, 23,737, against 21,239 and 19,499.

Tin.—London improved for the week from £95. 2/6 spot and £94. 17/6 futures to respectively £96. 7/6 and £96. 5/. Sales, 1270 tons. Our own market has been active and tending upward, the sales aggregating 100 tons at an advance of 15¢ per 100 lb during the week. The closing prices to-day on a firm market are as follows: Spot, 21.40¢; November, 21.40¢; December, 21.45¢; January, 21.50¢; February, 21.45¢, and March, 21.40¢. **Tin Plates.**—Our market has been inactive and featureless, with only a moderate trade doing at the quotations below. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, \$5.25 @ \$6; Coke finish, \$5.20 @ \$5.25; Coke Tins, Penlan grade, \$4.75 @ \$4.80; J. B. grade, \$4.85 @ \$4.90, and Wasters, \$4.50 @ \$4.55.

Lead.—Some 300 tons Common Domestic have changed hands at 3.75¢ @ 3.80¢, which is also the closing figure, although it cannot be laid down here for less than 3.85¢, St. Louis being active at 3.60¢ and Chicago at 3.65¢. Early in November the Mechernich and Stolberg Lead companies, together with leading Belgian, French and English producers, held a meeting at Cologne, Prussia, for the purpose of laying down the basis for the formation of a syndicate to control production and prices. A renewed attempt will be made to win over the Spanish producers. Till this is done all those present agreed to hold back, with sales at ruling prices. The effect was to start the advance in London. During the first nine months Spain exported 98,581 tons of Pig-Lead, against 97,917 in 1888 and 99,168 in 1887.

Spelter.—The market here has continued tending upward, a few carloads being sold at as high as 5.25¢, and 5.35¢ now generally asked. We quote Silesian, as heretofore, 7¢. Calamine exportation from Spain during the first nine months has been 19,069 tons, against 23,105 last year and 20,698 in 1887.

Antimony.—The quotation to-day is 28¢ @ 30¢ for Cookson's brand and 21¢ for Hallett's.

New York Metal Exchange.

The following sales are reported:

THURSDAY, November 21.	
10 tons Tin, November.....	21.30¢
10 tons Tin, spot.....	21.35¢
FRIDAY, November 22.	
100 tons Iron, March.....	\$13.37½
100 tons Iron, December.....	18.00
SATURDAY, November 23.	
10 tons Tin, December.....	21.40¢
MONDAY, November 25.	
10 tons Tin, spot.....	21.40¢
25 tons Tin, November.....	21.45¢
25 tons Tin, 1st half December.....	21.40¢

Imports.

Hardware, Machinery, &c.

Adam, E. W. & Co., Saws, box 1
 Alenquist, A. W., Mach'y, cs., 21
 Aufmardt, C. A. & Co., Mach'y, cs., 7
 Batram Bros., Old Mach'y, pgs., 1
 Boker, Hermann & Co., Mdse, cs., 16
 Cooper, Hewitt & Co., Mdse, cs., 65
 Curley, J. & Bro., Cutlery, case, 1
 Electric Cutlery Co., Mdse., cs., 6
 Erie Dispatch Co., Mach'y, cs., 3
 Graef Cutlery Co., Cutlery, cs., 4

Henderson Bros., Fire-Bars, 276
 McPaddin, H. G. & Co., Hardware, cs., 3
 Outerbridge, A. E. & Co., Iron Columns, 16
 Pratt & Farmer, Hardware, cs., 4
 Sheldon, G. W. & Co., Mach'y, cs., 21
 Sanderson & Son, Mach'y, pgs., 4
 Ward, Jas. E. & Co., Mach., pcs., 85; Iron Wagons, 50
 Wiebusch & Hilger, Lim., Hardware, pgs., 16; Mdse., cs., 11
 Witte, John G. & Bro., Cutlery, cs., 8
 Order—Mach'y, cs., 109; do., pcs. and pgs., 20

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., November 26, 1889.

Pig-Iron.—The market still remains in the position noted during the past two or three weeks. Prices are gradually working toward a higher level, and average 50¢ to \$1 higher than were current at the beginning of the month. But the furnaces are not quoting for 1890, so that virtually there are no prices except for small lots, and it is altogether problematical what figures will be named for deliveries during the first quarter of the coming year. Of course reasonably fair estimates can be made, but after all it will be mere guess-work. One or two companies who have been urged by their customers to name prices of some kind, have said \$18, \$19 and \$20 at tide for the three grades. On the other hand, there are nominal quotations of \$16, \$17 and \$18, but these are from parties who have no Iron for sale. Actual business, however, has been done during the week at \$17 @ \$17.50 for Gray Forge, \$18 for No. 2 and \$19 @ \$19.50 for No. 1. Judging from the firm undertone of the market and from the steady appreciation in cost it is not improbable that the figures first mentioned will be used as a starting point, although even these prices may be accompanied by restrictions as to quantity and date for delivery. But the feeling is unusually sensitive, and prices might easily be pushed higher than those we have suggested, although furnace holders are not disposed to abandon the conservative attitude which has recently characterized them. The enormous output, combined with preparations on all sides for its still further development, is a continual warning against high prices, and will not be lost for the present at all events. Still, with all the conservatism of the Old World and with large stocks and large possibilities for increasing their production, prices there have in some cases been nearly doubled, while 60 per cent. is less than their average advance. It is true that we are not now in the least degree dependent on any country for quotations, but we are in some measure competitors with them for Ores, and at that point trouble may be encountered. Furnace men have got along very well so far, but the real danger is in the scarcity of immediately available Ores. At present there is no serious apprehension of danger, but the strain will soon be felt if there is any material increase in the number of furnaces "blown in." These and similar considerations render it a matter of extreme difficulty to forecast the future, and doubtless have had much to do with the unwillingness of makers to name prices for forward delivery. Bessemer is very scarce and prices are hardly quotable, as everything for early delivery is taken up. A leading firm in that speciality, however, inform us that they hold for figures equivalent to \$23 at Philadelphia, although a 5000-ton lot was secured to-day at \$21 at furnace near by.

Blooms.—Mills are sold up, so that new business is somewhat rare. One lot of 1000 tons Soft-Steel Billets was taken at \$36.50, delivered at mill near Philadelphia.

Muck-Bars.—The market is a little unsettled and sales have not been numerous, owing to the difficulty in harmonizing the ideas of buyer and seller in regard to de-

liveries. The usual price is \$30, at mill, although some hold for higher figures, while still others have shaded \$30 for prompt deliveries.

Bar-Iron.—There is no material change in this department, although the feeling is one of firmness throughout the entire trade. Country mills are quoting 1.9¢, f.o.b. cars, and city mills 1.95¢ @ 2¢, but none of them are pushing for orders, as they have plenty of work for the present. A meeting of the Bar-Iron manufacturers is to be held in this city on the 4th of December, and until that time no change in prices is expected, and perhaps not then. An advance of $\frac{1}{10}$ ¢ would carry with it an advance in labor, and, as material is also likely to be dearer, the $\frac{1}{10}$ ¢ would be pretty well eaten up before it got to the manufacturer, so that the outlook will have to be very clearly defined before any further advance is agreed upon. Meanwhile prices are very firm as above named, with the most encouraging outlook as regards consumption. Skep-Iron is firmly held at 1.9¢ for Grooved and 2.15¢ @ 2.2¢ for Sheared, but no great amount of business has been taken recently.

Plates.—There has not been a great deal of business given out, but there is a large amount under negotiation, with prospects of its being closed at an early date. The mills are all liberally supplied with orders and there is some difficulty in meeting the requirements of buyers as regards deliveries, so that new contracts are not easily placed unless on terms somewhat in sellers' favor. Prices are firm and usually quoted as follows: 2.30¢ @ 2.35¢, delivered, for Ordinary Iron Plates and Tank-Plates; 2.40¢ @ 2.45¢ for Universal Plates; Shell, 2.6¢ @ 2.7¢; Flange, 3.25¢; Fire-Box, 3.75¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.50¢ @ 2.60¢; Shell, 2.75¢ @ 2.8¢; Flange, 3.15¢ @ 3.20¢; Fire-Box, 4¢ @ 4½¢.

Structural Material.—Mills are full of work for a long time to come and are therefore quoting a little higher prices on all new business. There may be some delay in specifying on a portion of the work, so that small orders are being squeezed in as opportunity offers. Prices are quoted about as follows: Bridge Plate, delivered, 2.35¢ @ 2.40¢; Angles, 2.30¢ @ 2.35¢; Tees, 2.7¢ @ 2.8¢; Beams and Channels, Iron and Steel, 3.1¢; Steel Plates and Angles range from 20¢ to 30¢ higher than the same in Iron.

Sheet-Iron.—The demand is well maintained, and pretty nearly the entire product is taken as soon as ready for delivery.

Steel Rails.—There is a fair inquiry for Rails, but sales during the week have not been of much importance. Prices are firm at \$35, at mill, and so far as this market is concerned nothing below that would be accepted for the present.

Old Rails.—The supply is so small that business is necessarily of a limited character. There are buyers, however, at from \$26 to \$26.50, c.i.f., duty paid, but prices abroad will not permit of shipments at near those figures. Sales been made at from \$27 to \$27.50, delivered in consumers' yards, and these may now be considered inside figures for such deliveries.

Scrap-Iron.—Prices firm, with an advancing tendency. Sales at about the following prices: No. 1, \$24 @ \$25 for carload lots, delivered; or for choice, \$25.50; No. 2 do., \$17 @ \$18; Turnings, \$16 @ \$17; Old Steel Rails, \$20 @ \$22; Cast Scrap, \$15.50 @ \$16.50; do. Borings, \$11 @ \$12; Old Fish-Plates, \$27 @ \$28.

Nails.—The demand is not so active as it was a little back, but prices are very firm at about \$2.20 for Iron Nails. Steel are quoted 20¢ @ 25¢ above the same

Nails in Iron, but there are very few willing to pay the difference, so that the demand is mostly for Iron.

W. R. Hart & Co., of Philadelphia, have leased the Edge Hill Furnace, which is to be immediately "blown in" and run on Bessemer.

J. W. Hoffman & Co. have been appointed sales agents for the Shenandoah Furnace Company's Gem Furnace, at Milnes, Va., and for the Sharon Steel Casting Company, Sharon, Pa.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, November 27, 1889.

American Pig.—As indicative of the position which the great Southern Iron producers assume, we may state that yesterday the managers of Tennessee Coal, Iron and Railway Company (the largest individual company producing Foundry and Forge Iron in the country), at a meeting held in this city, decided to fix upon prices f.o.b. furnace which are equivalent to \$20.11 per ton, delivered New York, for No. 1. The representatives of the company express their determination to proceed in a conservative manner to avoid playing into the hands of the speculative element in any way. The position of the leading Southern companies is particularly favorable, since they have control over their own raw materials. They own their Ore and Coal property, so that their cost is but little affected by rise in Ore and Coke, while the fluctuations in the labor cost are not great. In the East, with the exception of a favored few, the furnaces must depend upon Ores purchased in the open market, few control their own fuel, while some use Lake Ores, which apparently will be \$1 at least higher for the coming season than this spring. The Southern furnaces therefore possess a power in the direction of keeping the rise in bounds which must be recognized by the trade. It is reported that the shipments of Southern Iron are growing a little free, so that that source of trouble and annoyance is lessening.

Spiegeleisen and Ferromanganese.—There is some inquiry, but no business of any consequence has been closed. German Spiegel is offered at \$34.75, while for English \$35 @ \$35.50 is being asked. Ferromanganese is quoted \$90 for the second quarter of 1890, \$92.50 for the first quarter and \$100 spot, which is very scarce.

Billets.—No transactions of any consequence are reported by Eastern mills represented in this market, deliveries being still considerably in arrears. Inquiries, however, continue urgent. In the West it is reported that Wheeling mills have been selling on the basis of \$34.50 @ \$35.

Rods.—Sales have been made of domestic Rods at the rate of \$53, at buyers' mill. For foreign Rods, No. 5, \$54 @ \$55 is quoted, no sales being reported.

Steel Rails.—However forcible may be the argument of those who adhere to the nominal quotation of \$35 at Eastern mill on the ground that prices of raw material and the tendency of the Bessemer Pig market make it unsafe to sell below the price named, the fact is that Steel Rails are obtainable both East and West at considerably lower figures. In the East \$32.50 has been quoted during the last week without leading to a purchase on the part of the buyer. While the quantity thus available may be small and the quotation in question may be withdrawn at any moment, the fact remains that the market has certainly not yet reached the \$35 basis. It may do so with a rush, and the lower price named can certainly be secured

only by the best of buyers, so that under the circumstances the market may be quoted \$33 @ \$35, with the market in favor of the seller. In the West Pittsburgh is the lowest market at this writing. We note a sale of 12,000 tons to a Southern road, delivery during the first half of 1890, at \$32, at mill, which would indicate some confidence on the part of the mill in its ability to secure or produce Pig-Iron under \$20. An interesting sale by a Western mill is one of 5000 tons to a Mexican road, for prompt delivery, in competition with foreign mills.

Manufactured Iron and Steel.—The structural mills report full order-books, but have not during the week closed any contracts in the local market of any magnitude for architectural purposes. In Ship-Plates we note a sale of 600 tons by a Western mill for a boat at Buffalo. There is an order in the market also for four larger vessels, calling for 2000 tons each. The great feature at the present time is the large discrepancy between Steel and Iron prices. Steel Tank is quoted 2.65¢ @ 2.70¢, while Iron is 2.25¢ @ 2.3¢ and Refined 2.35¢ @ 2.4¢. Steel Shell is 2.85¢ @ 3¢ and Iron Shell 2.40¢ @ 2.45¢. Steel Marine Plates are 3.4¢ @ 3.5¢. Iron Flange is 3.50¢ @ 3.55¢. Steel Fire-Box is 3.6¢ @ 3.7¢ for ordinary grades and 4.10¢ @ 4.30¢ for best. Iron Bars, too, have not advanced as heavily as Steel, Pittsburgh Bars having sold in this market during the week at 1.90¢, delivered, for Refined Bars. These unusual differences must adjust themselves. It is worthy of note that today Marked Bars are selling at English shipping ports at prices slightly higher than equivalent American Iron Bars in New York.

Swedish Iron.—The market for Rivet-Rods has advanced to \$70, ex-ship, New York.

The De Bardeleben Coal and Iron Company, of Bessemer, Ala., who have recently consolidated with the Bessemer Steel and Iron Company, of the same place, and the Eureka Furnace Company, have appointed Edmund D. Smith & Co., No. 208 South Fourth street, Philadelphia, and George W. Stetson & Co., No. 69 Wall street, New York, their exclusive Eastern sales agents. The consolidated companies will have, next month, seven furnace stacks in blast, with a daily capacity of from 800 to 1000 tons of Pig-Iron, and have contracted for two more stacks to be erected immediately. Edmund D. Smith & Co and George W. Stetson & Co. were the former sales agents for the two stacks of the De Bardeleben Coal and Iron Company before the consolidation, and sold about 80 per cent. of the product in the Eastern market, where the Iron is well and favorably known. They anticipate a much more extensive business for account of the consolidated companies, as they are thoroughly familiar with the trade in the Eastern markets.

Louisville.

LOUISVILLE, KY., November 25, 1889.

Pig-Iron.—The market has been very active during the past week and large blocks of Iron have been purchased for delivery running usually during six months of next year. The bulk of the Iron purchased has been for actual consumption, showing that consumers of Iron feel that the present prices are reasonable, and that they are willing to purchase for their season's wants in large quantities. Prices for Iron, however, are very unsettled, there being nearly \$1.50 between the views of different furnaces. Charcoal Irons have not fully responded and Coke Irons are being held in some in-

stances higher than Hot-Blast Charcoal grades can be purchased at, but that this cannot last long is evident, and buyers are astonished that in the face of a rapidly advancing market so little advance has taken place in Charcoal grades.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, November 25, 1889.

Pig-Iron.—Since Wednesday the local market for Pig-Iron has been very quiet. There has been no loss of strength; on the contrary, some advance has been realized, but consumers have been less anxious to buy and speculators have been less enthusiastic. Southern furnaces, however, have secured such large contracts for long and short deliveries that they have virtually retired from the market for the time being. At the same time, the market has risen to such a point that Northern stacks can more successfully compete with Southern producers, and have been taking profitable orders at prices which Southern furnaces have declined, either from inability to supply the iron or from a desire to receive the full measure of the advance based upon the warrant system. The advance in fuel and other material, as well as advance in freight rates, has somewhat increased the cost of production of Pig, but this is small compared with the enhancement of the selling price. While the inquiry for iron is now largely for very long delivery, it is notable that the few sales of moment recorded are near delivery. Since Wednesday the most important sales of Southern iron have been 3500 tons Gray Forge at \$17, here, and 3000 tons No. 2 Soft, equivalent to \$17.25 here, December delivery. Louisville seems to have successfully competed with Cincinnati for several thousand tons No. 3 Southern Foundry on basis of \$17.25 here or 25¢ less at the Kentucky point. Sales of Northern iron have been small individually, but considerable in the aggregate, on the basis of quotations.

Old Material.—There has been a fair inquiry and light offerings of Old Northern Rails, which are quotable at \$27.25 @ \$27.50, cash; 500 tons Southern Rails have been reported sold at \$26.50. Moderate amounts of Old Wheels have been sold at \$19.25, cash.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, November 26, 1889.

Pig-Iron.—There has been a largely increased volume of business during the past week, sales of several large blocks having been effected, and that, too, at an advance of 25¢ @ 50¢ per ton. Bessemer was in greater demand than any other kind, and brought more of an advance. It may also be stated in this connection that this last spurt was generally unexpected, as the general belief obtained that the market would rule quiet but steady during the remainder of the present year. Sales of some 30,000 tons were reported for the week, and there is always a good deal of business which is kept private. We quote prices as follows:

Neutral Gray Forge.....	\$16.75 @	\$17.25, cash.
All Ore Mill.....	18.00 @	18.25, "
White and Mottled.....	16.00 @	16.25, "
No. 1 Foundry.....	18.50 @	18.75, "
No. 2 Foundry.....	17.50 @	18.00, "
No. 3 Foundry.....	16.75 @	17.00, "
No. 1 Charcoal Foundry.....	24.00 @	25.00, "
No. 2 Charcoal Foundry.....	22.00 @	22.50, "
Cold Blast Charcoal.....	25.00 @	26.00, "
Bessemer Iron.....	21.50 @	22.00, "

Some furnace men are now asking \$17.50, cash, for Neutral Gray Forge and \$22.50, cash, for Bessemer, but so far as we are advised there have been no sales of the former above \$17.25 and of the latter

above \$22, but the former prices are likely to be realized before the close of the week.

Muck-Bars.—There does not appear to be much inquiry for either this month or next, but sales could be made for delivery during the first quarter of next year. We continue to quote at \$30 @ \$30.50, cash, for delivery during the remainder of the present year.

Manufactured Iron.—There is a continued good demand and prices are firmer, but unchanged; Bars are still quoted at 1.80¢ @ 1.90¢; No. 24 Sheet, 2.90¢ @ 3¢; Plate and Tank, 2.35¢ @ 2.40¢; Skelp, 1.80¢ @ 1.85¢ for Grooved and 2.10¢ @ 2.15¢ for Sheared, 2¢ off for cash.

Old Rails.—There has been an increased demand for Old Iron Rails, and the market is firmer. We can report sales of 2000 tons at \$27 @ \$27.25, which may be regarded as the ruling prices. We can report sales of Old Steel Rails at \$22 @ \$22.25 and \$22.50, with rather more inquiry.

MARKETS BY TELEGRAPH.

WEDNESDAY MORNING.

Cincinnati.

The market is without important change, quiet but firm. Sellers of Southern iron are confident of much higher prices, but several of the largest are willing to sell for late delivery on the basis of \$18 for No. 3, \$18.50 for No. 2 and \$19 for No. 1 Foundry and \$17.50 for Gray Forge, but no buyers beyond 50¢ to \$1 per ton less can be induced to take hold. Consumers are still able to obtain Northern iron at a lower actual or relative cost, and not until an equilibrium has been established can Southern furnaces reasonably expect to obtain higher prices. Car-Wheel iron remains quiet, but information was received this morning that Lake Superior iron has been advanced 50¢ per ton. Business is satisfactory in volume in the aggregate, but no individual sales of special importance are recorded. Hosford & Fisher will dissolve and two new firms will be created, C. E. Guthrie and C. B. Hsely.

St. Louis.

Southern furnaces refuse to quote prices for Pig-Iron and intimate that it will be 30 days before they will be in a position to take orders. Inquiries are received for small lots for immediate shipment, which seems to indicate a waiting policy. The general opinion among consumers is that prices are already too high and that the recent advance of from \$1 to \$2 per ton is merely the result of manipulation on the part of speculators, and under the circumstances they do not feel justified in paying fancy prices and thus helping to sustain a movement that from their point of view has already advanced rates considerably beyond what the legitimate demand warrants.

Chicago.

The market continues very strong, without any indication of lower prices in any branch. Pig-Iron is firm, with particularly good inquiries for Bessemer, which may lead to heavy business. Makers ask the full price lately quoted. The possibility of a local supply of Foundry iron is being greatly curtailed because the furnaces are being turned on Bessemer. The Youngstown rolling-mills are now so full of work that Bar-Iron prices

are stiffening up to 1.80¢, at mill, which is being asked for deliveries covering the first quarter of next year. Buyers have pretty generally closed up outstanding options at \$1.75¢ at mill, several large transactions having been made on that basis in the past few days. Structural iron is advancing. Some mills are asking \$2 per ton over old quotation on everything but Beams and Channels, and other mills are expected to follow suit. Old Material, Nails and Barb-Wire show no change from last report, but prices then given are firmly sustained.

British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, November 27, 1889.

The Pig-Iron market has been following in about the same course as during the preceding two weeks and prices still show wide and frequent fluctuation. Shipments of Cleveland Pig have fallen off more or less during the week, and considerable amounts are now going into store. Scotch warrants have weakened off to 61/7 under "bear" pressure and realizations and the set-back is having some influence upon operations in Cleveland Pig and Hematites. Scotch dealers are said to have cleared on this account £10,000 the past few days.

On the Continent the position continues very strong. Makers generally are booked months ahead and are very firm at the recent rise. Some refuse to book any further orders at present.

Purchases of Old Material have fallen off, owing to the fancy prices asked.

Tin-Plate has been in fairly active demand and makers are very firm at old prices. Statistics just published show 480 mills in existence, of which 460 are working. The capacity of the works is 50 per cent. greater at the present time than five years ago. The United Plate Company are forming to erect works at Swansea. The Ashburnham works and the Caerleon works will soon be started up.

Speculation in Block Tin has been quite active and the trade demand very fair. The late scarcity of available Tin has been relieved by fresh arrivals. Production is growing, but stocks on hand at the sources of supply are said to be small.

Copper has been strong and Merchant-Bars advanced to £49. 7/8 on Tuesday, although warrants have been plentiful through large realizations of lots previously held back by Chileans and outside French holders. Consumers have purchased freely of Merchant Bars. The production, it is believed, will be stimulated by present prices. The Tharsis Company are reported to have made very heavy sales during the week, involving their entire production up to late spring months. The prices realized are said to average over £51 per ton.

A meeting of the Bar-Iron Manufacturers east of the Alleghenies has been called at the rooms of the American Iron and Steel Association, Philadelphia, December 4, to consider the condition of the business.

Amesbury, Mass., has a board of trade which has recently taken a suit of rooms. W. W. Smart is the president.

Hardware.

There has been during the past week or two something of a falling off in the volume of business in general Hardware. This is accounted for in good part by the fact that most of the goods which lie near the raw material have already been liberally advanced and orders for them have been quite generally placed by large buyers, so that the trade are not now purchasing as freely as of late. In many other lines, including a large proportion of Tools and general Shelf Hardware, no advance has occurred, and at the present time prices of such goods are as low as they have ever been, with only slight indications of increased firmness. In this condition of things the trade are waiting to observe the course of the Iron market, which will have much to do with the prices that are to prevail next season.

Cut Nails.

New business in the New York Nail market is light. The market is firm at \$2.10 for Iron Cut Nails in carload lots.

Miscellaneous Prices.

Several of the leading Sand-Paper manufacturers have been conferring with a view to renewing their combination, and it is thought probable that this will be accomplished and that most of the manufacturers will be included in the arrangement. It is understood, however, that one well-known house refuses to enter it.

Loaded Shells are very firm and higher. It is also difficult to obtain them from the manufacturers on account of press of orders. At the present time jobbers who have a stock of the goods are in many cases selling them at lower prices than the manufacturers, but they are gradually advancing them.

Manufacturers of Malleable Iron Carriage and Wagon Hardware are withdrawing former quotations and announcing advances ranging from 10 to 15 per cent.

Something of an advance has been made in the price of Copper Rivets and Burrs and the market in these goods is firm and strong.

At the recent meeting of the manufacturers of Wrought-Iron Pipe, held in Philadelphia, 19th inst., it was not considered advisable to make any change in prices at the present time. The fact that the recent advance in the list together with changes in discount has given them materially increased prices for the goods had something to do with the decision not to make another advance, but the fact that some of the jobbers who are carrying considerable stocks of Pipe are offering it at concessions from the manufacturers' prices had also considerable weight. The whole subject was therefore deferred until the next meeting, which occurs in December.

Solid-Box Vises are firm, and some of the manufacturers have already made advances in their prices ranging from 5 to 7½ per cent.

The Auburn Tool Company, Auburn, N. Y., announce an advance in their Thistle Plane-Irons, the discount on which is made 35 per cent., instead of 40 per cent., as heretofore.

Lawrence Curry Comb Company, 204 to 210 East Forty-third street, New York, issue a circular to the trade referring to the advancing prices of Iron and Steel and suggesting the placing of orders for Curry-Combs and Boring-Machines at once and for prompt shipment, stating that after December 1 they will only accept orders subject to price and stock at time of shipment.

Manufacturers of Sieves announce higher prices. The market is thus steady, with an upward tendency.

Advanced prices on Wire Rope are announced. This has followed as a natural result of the successive advances in Wire.

In our issue 14th inst. an error occurred in printing the discount-sheet of the Ohio Tool Company, Columbus, Ohio, by which Bench Planes were designated as Fancy Planes. The following is the correct form of the quotations then given. Terms, 30 days, or 2 per cent. discount for cash in 10 days:

	Discount.
Fancy Planes, all kinds.....	50&10 %
Bench " stamped Ohio Tool Co.....	55&10 %
" " Scioto Works.....	60&10 %
" " Apple, Box and Rosewood.....	35 %

While the increased cost of raw material has made prices of both Cast and Wrought Iron Fencing firmer and in some instances a little higher, there has been no general advance. The market is, however, characterized by an excellent tone, and the demand for the goods is larger than usual. Buyers are purchasing in larger quantities and not so much from hand to mouth as usual at this season. The manufacturers are pursuing a conservative course in regard to announcing revised prices, awaiting developments of the market, and preferring not to announce an advance unless it is to be maintained.

The Axle market is steady and firm. Orders are reported as coming in freely, but no further advance has been made by the manufacturers.

The Pump market continues in the same condition in which it has been for the past few weeks, except that some of the manufacturers are withdrawing their extreme prices and making advances of from 5 to 10 per cent. Many leading lines of Pumps have been for some time selling very near cost, and there is no doubt that if the present prices of Iron are maintained a general advance will be announced before long. The fact that, as usual at this season, there is only a moderate demand for the goods has had its influence in preventing the manufacturers from announcing advanced prices before this. Most of the manufacturers refer to the trade of the past year as having been exceptionally good and as being at the present time of fair volume.

Items.

At a meeting of the Heavy Hardware Jobbers' National Union, which was held at Detroit recently, the following officers were elected for the ensuing year: President, Gaius Paddock, of the Paddock-Hawley Iron Company, St. Louis; vice-presidents, George Deming, of Cleveland; Francis Boyd, of Milwaukee, and Wm. B. Dean, of St. Paul; secretary, F. K. Maus, of Kelley, Maus & Co., Chicago; treasurer, George A. Seefield, of Milwaukee. Executive Committee: S. D. Kimbark, of Chicago; David Kelley, of Chicago; J. J. Parkinson, of Chicago; C. R. Blake, of St. Louis, and Robert Donahue, of Burlington, Iowa.

A serious hitch has occurred in the negotiations of the parties interested in the Federal Steel Company, and some doubt is expressed whether the scheme will go through.

Maryland Tack Company, Baltimore, Md., have issued a well-printed discount-sheet and price-list of their Tacks and small Nails. Among these the Monumental Steel Carpet Tacks are especially referred to, with illustration of the attractive method in which they are put up. These Tacks are packed in neat and substantial hinged boxes, and are referred to as making a very showy and profitable counter display. They are put up in five different sizes of uniform weights of 1, 2, 3, 4 and

5 ounce papers, blued, bright, polished and tinned. The scheduled weights of dozed Hardware list goods in Straight, Star, Standard and Special weights are given.

C. E. Jennings & Co., 97 Chambers street, New York, issue a circular describing Thompson's Perfect Plumb-Bobs, illustrations being given of No. 9 for surveyors' and No. 6 for mechanics' use. These goods are referred to as positively accurate and artistic. They are made of bronze, beautifully finished, with fine steel points.

The I. L. Ellwood Mfg. Company, DeKalb, Ill., are distributing the Glidden Pocket Compendium, which is a very bright pamphlet of some 50 pages, well printed and bound in a neat paper cover, which is arranged after the style of the usual leather-covered pocket memorandum-book, having a flap and pouch. The contents embrace a calendar for each of the 12 months of 1890, with blank spaces for memoranda. Interleaved between the parts of the calendar are indorsements and testimonials of the Glidden Wire.

Chicago Drop Forge and Foundry Company, Kensington, Ill., manufacturers of Solid Forged Steel Shears and Scissors, Carriage Hardware, &c., have appointed the S. A. Haines Company, 90 Chambers street, New York, their agents.

Our Chicago office was favored with a call during the past week from C. Haw, of the firm of Geo. Haw & Co., wholesale Hardware merchants at Ottumwa, Iowa. Mr. Haw reports an excellent trade in progress in his section, with the farmers generally in a prosperous condition and free buyers of merchandise of all kinds.

The Gilbert & Bennett Mfg. Company, 42 and 44 Cliff street, New York, issue circulars describing Snow's Steel Mat, for which they are agents for New York and New England.

American Screw Company, Providence, R. I., have recently obtained a patent on Horse Nails, in which some features of their swaging process of manufacturing Screws are applied to Horse Nails.

Jersey City Smelting Works, Jersey City, N. J., have issued revised prices of their standard grades of Babbitt-Metals.

T. W. Lockwood, Jr., 269 River street, Troy, N. Y., issues a price-list representing the line of Children's Sleighs, Skates, Snow-Shovels, Tricycles, Velocipedes, Rocking-Horses, Express-Wagons, &c., which he is selling. Attention is also called to a variety of holiday goods, toys and novelties, mechanical toys of iron, &c.

The Joseph Dixon Crucible Company, Jersey City, N. J., and 68 Reade street, New York, issue a circular relating to Dixon's Graphite Grease, which has been on the market for some time. An explanation is given of its composition, its use is indicated and a comparison made with other Graphite Greases.

Northampton Cutlery Company, Northampton, Mass., are putting on the market a new line of Silver-Plate Steel Knives and Forks bearing the trade-mark, "American Silver Plate Company," *fac-simile* of which is shown in their advertisement on page 65. They state that these goods are of best finish and durable plate, neatly boxed and labeled and put up in sets; also Knives and Forks only, designed to meet a demand for a low-priced but durable and showy article. The Northampton Cutlery Company manufacture a very complete line of Table Cutlery, Carvers, Butchers, &c., and are continually adding to their already extensive variety.

We are indebted to Manning, Bowman & Co., Meriden, Conn., whose salesrooms are at 57 Beekman street, New York, for

a copy of the pamphlet gotten up as a *sovenir* for the South American delegates to the International American Congress who visited Meriden October 10. The pamphlet, bound in white card-board, tied at the back with a silk ribbon, conveys the compliments of Manning, Bowman & Co., in a light tint. The contents of the little volume, covering some 40 pages, are devoted to a description of the principal works in this busy Connecticut city. Manning, Bowman & Co. are noticed on page 14 and a few particulars are given of their works and of the features of their Tea and Coffee Pots. Articles of the ware which they manufacture are illustrated in connection with it.

The Gilbert & Bennett Mfg. Company, Georgetown, Conn., and 42 Cliff street, New York, have purchased the adjoining premises, 44 Cliff street, a five-story brown-stone warehouse, which they have annexed to their present store. This gives enlarged facilities for handling their goods, the demand for which has so increased as to require this addition.

Exposition of 1892.

We are advised by James H. Goldey, of the Hardware Board of Trade, 4 and 6 Warren street, New York, that the following additional subscriptions have been made toward the guarantee fund for the International Exposition of 1892:

Charles Parker Company.....	\$2000
Abendroth Bros.....	1000
Eugene Munsell & Co.....	500
Mayor, Jane & Co.....	500
Sam S. Utter.....	250
C. F. Guyon & Co.....	250
Tower & Lyon.....	250
Campfield & Wood.....	100
John Loyd.....	100
Alford & Berkele Company.....	100
Chas. J. Healy.....	100
Wm. H. Jacobus.....	100
R. M. Jacobus.....	100
Thos. Taylor.....	100
Adolph Kastor & Bros.....	100
Landreth H. King.....	100
Hezekiah King.....	100
W. Edgar Pruden.....	100
Topping & Fox.....	100
Commonwealth Rubber Company.....	50

Trade.

From our Louisville correspondent we have the following advices:

The Hardware trade has been a little quieter in some respects for the past week, orders not coming in with the rush recently prevailing. This is attributable to the season, most merchants having laid in supplies, and again the buoyancy of advancing markets is lacking, but jobbers are still holding at firm prices. It takes a considerable time for the advance in Pig-Iron to have any effect on the Hardware trade. The amount of business going on is larger than this time last year, and as profits are more satisfactory the dealer cannot complain.

It is best that the inclination to boom was quieted, and from now on probably there will continue a healthy legitimate trade. Some dealers are like certain manufacturers, afraid to hold moderate stocks for regular trade, and if prices do not advance they must reduce figures in order to keep things moving. It is a pity that such instability should in a measure control the course of trade, but such certainly is the case in the Cut-Nail market at present. There is no reason why the Nail mills should not resort to a little staying power. The past 60 days have been extremely prosperous to them, the prospect of a fine spring trade 60 days hence was never better, and the small interim of 30 to 60 days of a dull period should not be such a bugbear as a few mills seem to fear. The trade are willing to pay \$2.25, at mill, for current and future wants, and are anxious to see prices maintained, but with some factories offering at \$2.15, at mill, there spreads a feeling of distrust and lack of confidence, not surprising in the dealers, for they get it direct from the manufacturers and it affects all other branches, particularly Barbed Wire, which is remarkably firm, yet the dealers are afraid to contract ahead for their customary wants, except in some few bold instances. Factories are receiving some nice orders, enough to make them feel good and maintain full prices of 3.75 cents, delivered, Ohio River points. Dealers do not fear the Federal Steel Company combination, as some of the largest mills that usually supply this

and more Southern markets are not in the trust and assert that they will not be forced into it; in fact, jobbers look with suspicion on all such pooling arrangements as only an effort to boost prices, load up the trade and leave them in a bad fix "with no pitch hot," but plenty of ire. Barbed Wire is selling from store at 3.70 to 3.75 cents. Wire Nails are in great demand from store and factory and enjoying the most active trade for years; 3 cents from factory and about the same from store is ruling price. Cut Nails are also going out in good orders, netting a fair profit in cost price. Bar and Sheet Irons are still in good demand, mills being full of orders, and those dealers who had faith enough to buy at 1.55 to 1.60 cents months ago are now having a good time. Carriage Goods are still active, with some improvement in prices, and the Hub and Spoke factories are working night and day. In view of further advances some dealers are placing orders for Common Carriage-Bolts for next season's delivery.

Trade Topics.

From a Massachusetts Hardware man we have the following communication, which explains itself:

Manufacturers of Wire Nails and Brads in their haste to advance prices are overlooking one important feature that is demoralizing to the retail trade and causing a great deal of inconvenience. There are three different price-lists of Steel Wire Brads and two or three lists for Standard Wire Nails. We believe that when the association hold their next meeting one of their first acts should be to adopt one list for all manufacturers of Steel Wire Brads, and also agree upon the extras to be used for Standard Wire Nails. A clerk has hardly time to become familiar with one list before another is adopted and costly mistakes are liable to occur. This is an age of progress and we ought not to return to the errors of 20 years ago.

We have received the following with reference to the Star, Standard and Special weights of Tacks, our correspondent giving his view as to the circumstances under which goods thus put up were placed on the market:

Noticing article in *The Iron Age*, November 7, headed "Tacks," I would say as one thoroughly familiar with the Tack business for the past 20 years, that the true explanation of the Star, Standard and Special weights is, they were originated and are maintained to cater to the grocery trade. The Hardware trade generally desire full, half and quarter weights, as established by long custom. The grocery trade call for under-weights in order to cut prices and divert trade from Hardware to grocery stores.

A correspondent thus succinctly describes his different methods of keeping track of the cost of goods:

1. I mark all shelf goods directly on box or package.
2. Heavy goods, including such staples as Wire, Nails, Iron, &c., I mark a card and hang up alongside of the goods.
3. Such goods as Barrows, Plows, Pumps, &c., I index in small book.

From a Hardware man in Illinois we have the following in regard to his method of ascertaining the cost of his goods:

The actual cost of each article on every bill is figured and marked up as the goods are received. Being situated so near good Hardware markets as I am, the transportation does not cut the figure that it does on the Pacific Coast, yet I get everything figured as close to cash on its arrival as practicable. True, if I buy, say, a bill of several hundred dollars of mixed goods, probably varying all the way from Cutlery to even as cheap goods as Sash Weights, then it is considerable trouble to get the exact cost of freight on each as it should be, and I then figure the goods at just the per cent. that it costs to freight and box the goods to me, which figures on most of the goods that I buy from 3 to 5 per cent., varying on the different classes of goods bought. After having the exact cost of the goods as they arrive it is surely little trouble to take the inventory, except where there is a variation in the value of

the goods at the time of taking inventory, and that part is easily adjusted.

Referring to a similar matter a Hardware man in Michigan writes:

The question of how to take stock and figuring freight is one that does not trouble the ordinary country merchant. Their usual way is to go through the stock without any special reference to the ruling price of the day or the cost of the freight. They enter all goods found in stock and figure up at cost price, and if the goods have declined somewhat they will deduct something from face of invoice and let it go at that. But when one man sells his stock to another the usual rule to get at the market value, if they want to get at it fine, is to take stock by numbers and list, figure off discount that will, of course, show present price, and then if one has his freight bills on file he can get the classification of freight and by estimating the weight of articles inventoried of the heavy goods he can readily fix rate values, and on the balance of the stock, if he has kept a freight account, he can get a fair average per cent. on the shelf goods and light articles, so that it might be arrived at close enough for all practical purposes. My way of marking goods is to add freight. This rule, I think, is correct and ought to be observed by careful merchants. A stock should be turned over three or four times a year in a prosperous trade, and therefore on the average it would not be very far off from the market value at any time of invoice. A very good way where freights are high, as in the West, would be to keep a record-book of the cost of freight by the dozen or hundred rather than to add freight by percentage, which would be very convenient for close calculation on fluctuating markets.

Artistic Hardware.

The following article from *Ironmongery* recognizes the tendency in this country toward more artistic styles of Hardware and makes some suggestions with reference to the subject from the English standpoint:

When America begins to "yearn" for artistic Hardware it is quite time to begin to look for a permanent "set" in public taste toward a combination, in the work of the iron-monger and the smith, of pure utility with beauty in form or ornament; and there are signs that this yearning has commenced over the water. It is accompanied with some frank acknowledgments that portions of Europe, especially France and Germany, are much in advance of the rest of the world in the artistic excellence of their builders' iron-mongery and the employment of metal-work for interior decoration; a superiority which is, however, now found to be worthy of emulation, as public taste is improving and demanding something better than the manufacturer and metal-worker have hitherto supplied. This discovery is, as we have said, a sign of the times; it is the product of certain influences which were set going in our own midst several years ago and are gradually widening out and propagating a new want. It is a tendency which the manufacturer and the dealer should take note of, and which, once set in motion, they will find it to their profit to encourage. Neither one could give a first impulse to a purely artistic craving. It is not their business to educate the public taste, and the manufacturer who should set that task before himself as a duty would, in all probability, come to grief. The trader is the servant, not the master, of the wants of his customers. Even in those departments of trade, such as the drapers, where the caprice of fashion has to be reckoned with year by year, he is the most successful who is best able to foresee the exact poise of public taste six months or so in advance. Let him fall behind or leap in advance or try to divert the mysterious forces whose sum is "the fashion," and he is likely to find his stock on his hands when the season is at its end. Fortunately for the

dealer in Hardware he is not compelled to take so much account of fluctuations in popular taste, but though a less changeable and fickle master, it is master just the same. Partly, however, for the very reason that fashion is less erratic in the Hardware trade the maker and the trader are not so alert always to distinguish these slower movements and tendencies of the public fancy—such a tendency as is now manifesting itself, often in a very blind and stumbling way, it is true, but still a tendency toward the more artistic employment of metal, not only in pure decoration, but in articles of utility as well. But if the iron-monger cannot rouse a dead or dormant taste, he can encourage it where somebody else has roused it for him. It is the retail trader who comes immediately into contact with the public, and therefore most directly feels the effect of any change in the character or quality of public taste. He may resolutely set himself against encouraging what he regards as a mere "fad" of the day; he may give it no countenance, because it involves a certain amount of trouble for him, or because it is merely new. But, if so, he will probably find his competitor in the next street, who is more enterprising and quicker to seize upon a fresh popular demand, forging ahead of him and winning his customers. It is quite as hopeless a task for the retail trader to stem the current of popular taste which is setting in any given direction as it is to give the current its original impetus. Let him therefore make the most of this growing desire for higher artistic merit in all branches of builders' and furnishing ironmongery that are capable of receiving it. Why should he not utilize it and profit by it? The article which has nothing but bare utility to recommend it, that is cheap as well as ugly, sells readily because it is cheap, but the margin of profit is very small. An iron-monger may sell a large quantity of a certain pattern of door furniture, for example, with very meager returns, but a set of furniture which has some special merit of its own to recommend it to a purchaser is disposed of at a profit that more than repays the extra labor of selling it, and the more the iron-monger cultivates in his customers a desire for artistic merit in what they buy—the more skillfully and intelligently he ministers to this growing public taste—the larger business will he do in a class of goods which is certain to yield him larger profits than the staple and cheap patterns which the manufacturer turns out in unlimited quantities and which are found on the shelves of every iron-monger. Our suggestion does not involve any revolution in an iron-monger's stock of goods. A few good samples of really artistic work and some photographs or books of undeniably good designs are all that would be needed in the first place. He need have no fears of not being able to interest the great majority of his more intelligent customers in them, and when they find that an article of real merit in an artistic sense does not necessarily command an extravagant price they will not need much persuasion to take it, though it may cost them more than the equally serviceable but artistically meretricious article. The wide-awake iron-monger who sets himself in earnest to meet the rapidly-improving taste in this direction will find the field opening wide to him as he progresses, and new ways of utilizing it to his own advantage will suggest themselves. Those who cultivate it most promptly and assiduously will reap the largest return from it.

Hardware in England.

From the following remarks on the condition of trade in Sheffield, which are taken from the last issue of *Ironmongery*, it is apparent that the English market for Hardware is in a state somewhat similar to that which prevails in this country:

The markets continue in a very unsettled condition, and in some departments prices are advancing by leaps and bounds, while in others no change has

yet taken place. The enormous demand for raw materials, both for home consumption and for export, indicates very clearly that while speculation to some extent has been indulged in, the real cause of the rapid advances in prices is the fact that in most departments of trade demand has overtaken supply, and in some cases passed it. This fact, with other features present in the position, promises a maintenance of satisfactory business for a considerable time to come, although it is not unlikely that demand may lessen and prices recede somewhat from the present rates. This, however, will not occur just now, for the simple reason that buyers are laying in stocks beyond their average requirements with the view of escaping further advances, a policy which, however wise it may appear on the face of it, exercises a tendency to the result from which they seek to escape. It has been somewhat amusing to see the rush of orders in those branches of trade most likely to be further affected, and the real or affected indifference of the manufacturers and merchants concerned has been, in such cases, used in the direction of "screwing out" of the anxious buyers prices enhanced beyond the fair requirements of the case. A case in point came under my notice. A large English buyer of Files who had discontinued ordering because a small advance had been demanded sent recently a very large order at such advanced rates. The merchant wired: "Cannot accept. Terms 'so and so,' subject to your reply per wire;" "so and so" meaning a further material advance. The telegram confirming the order came to hand during the morning. Instances of this kind might be multiplied *ad infinitum*, and there is no doubt that the condition of trade is regarded as so well assured that manufacturers and merchants will seek by every possible means to enlarge their profits. The Edge-Tool trade is reported to be in a satisfactory condition so far as the volume of trade is concerned. The same holds good of the Saw trade, which is also affected materially by advances in raw materials, but in neither branch has it appeared possible to increase prices to any extent. Cutlery manufacturers are busy and prices are rising. A movement for an advance in the wages of Fork grinders and casters is on foot and will most probably result in some advance of wages, and it is not unlikely that the labor question may be to the fore ere long in other branches of trade.

Exports.

PER SHIP ENDORA, NOVEMBER 4, 1889, FOR MELBOURNE, AUSTRALIA.

By R. W. Forbes & Son.—18 packages Hardware, 132 pounds Fish-Lines, 2700 Cartridges, 21 dozen Axe-Handles, 5000 Cartridges, 2 cases Fire-Arms, $\frac{1}{2}$ dozen Wringers, 1 dozen Drills, 15 dozen Axes, 5 cases Fire-Arms, 3 packages Hardware, 4 dozen Traps, 18 Miter-Boxes, 1 case Lamp-Ware, 10 cases Household Utensils, 1 case Hardware, 2 dozen Lanterns, 20 dozen Axes.

By McLean Bros. & Rigg.—29 Stoves, 12 dozen Lawn-Sprinklers, 8 cases Hardware, 160 dozen Axes, 9 barrels Lamp-Ware, 6 dozen Saws, 1 dozen Hoes, 5 dozen Emery-Wheels, 8 Chucks, $2\frac{1}{2}$ dozen Fire-Arms, 21 Stoves, $\frac{1}{2}$ dozen Wringers, 1 Umbrella-Stand, 9 Emery-Wheels, 6 dozen Picks, 6 dozen Hoes, 49 dozen Axe-Handles, 9 dozen Bush-Hooks, 3 dozen Axes.

By Arkell & Douglas.—50 kegs Nails, 26 cases Handles, 7 cases Hardware, 4 packages Wringers, 1 case Jacks, 39 packages Carriage-Ware, 6 cases Bolts, 82 packages Carriage-Ware, 18 cases Handles, 3 bundles Wash-Boards, 11 boxes Axes, 10 packages Hardware, 38 packages Carriage-Ware, 33 cases Handles, 48 kegs Nails, 16 cases Handles, 25 kegs Hardware, 163 cases Tools, 8 packages Pumps, 4 boxes Tools, 38 packages Hardware, 26 kegs Nails, 1 case Saws, 1 case Money-Drawers, 20 cases Tools.

PER BARK ESSEX, NOVEMBER 8, 1889, FOR WELLINGTON, NEW ZEALAND.

By W. H. Crossman & Bro.—12 gross Hog-Rings, 19 Stoves and Parts, 80 Pulley-Blocks, 2000 pounds Nails, $\frac{1}{2}$ dozen Hay-Knives, 18 dozen Hammers, 3 Trucks, 1 gross Axle-Grease, 2240 pounds Axle-Grease, 142 pounds Iron Nails, 53 dozen Axes, 2700 pounds Horse-Nails, 4 dozen Grindstone Fixtures, $\frac{1}{2}$ dozen Sad-Irons, 5 cases Wringers and Parts,

5 Revolvers and 2000 Cartridges, 420 pounds Rivets, 5 dozen Bush-Hooks, 24 cases Hardware, 1 case Air-Guns and Slugs.

By A. S. Lascelles & Co.—1 case Scythes, 1 case Harrow-Ware, 1 gross Thermometers, 5 cases Crayons.

By Mailler & Quereau.—30 dozen Axes, 240 dozen Axe-Handles, 20 dozen Picks.

By H. W. Peabody & Co.—85 cases Edge Tools, 1 case Drill-Tips.

By Edward Miller & Co.—8 packages Lamp-Goods.

By Barclay & Co.—424 pounds Nails.

By McLean Bros. & Rigg.—29 dozen Axes, 25 sets Axes, 3 dozen Wash-Boards, 3 dozen Meat-Choppers, 9 dozen Egg-Beaters, 134 dozen Axe-Handles, 7 dozen Glue, 39 packages Carriage-Ware, 23 sets Axes, 10 dozen Sash-Cord, 7 dozen Saws, 1 dozen Wringers, 2 dozen Pruning-Shears, 1 dozen Plumbs and Levels.

By Arnold Cheney & Co.—1 case Hardware.

By Arkell & Douglas.—2 cases Handles, 2 cases Horse-Nails, 4 cases Churns, 2 cases Granite Iron-Ware, 19 boxes Axes, 12 crates Stoves, 4 cases Axle-Grease, 13 packages Hardware, 40 boxes Axes, 5 boxes Wringers, 5 boxes Handles, 5 boxes Plated-Ware, 11 packages Hardware, 2 cases Handles, 1 case Seed-Sowers, 4 cases Oil-Stoves, 12 packages Hardware, 1 case Carpet-Sweepers, 2 cases Oil-Stones, 17 packages Hardware, 3 cases Hatchets, 3 boxes Horse-Nails, 3 boxes Axes, 2 boxes Carriage-Ware, 2 boxes Castings.

By Strong & Trowbridge.—1 case Wood-Working Machinery.

FOR WELLINGTON AND AUCKLAND.

By R. W. Cameron & Co.—260 dozen Handles, 50 dozen Wash-Boards, 12 dozen Handles, 1 dozen Axes, 8 dozen Hardware, 50 dozen Axes.

FOR AUCKLAND.

By Arnold, Cheney & Co.—50 kegs Nails.

By Arkell & Douglas.—6 packages Stoves, 1 case Saws, 2 cases Hardware, 10 cases Handles, 177 reels Wire.

By H. W. Peabody & Co.—7 cases Hardware, 1 case Iron Castings, 160 dozen Handles, 13 packages Lamp-Ware, 9 dozen Thermometers, 1 case Lamp-Ware, 6 cases Fire-Arms, 12 packages Lamp-Ware, 24 gross Pencils, 2 cases Hardware, 1 case Wheels, 1 bundle Hardware.

By A. S. Lascelles & Co.—22,459 pounds Hardware, 200 gross Crayons, 20 cases Handles.

By W. H. Crossman & Bro.—10 Pumps, 2 dozen Emery-Wheels, 8 dozen Lamps, 2 dozen Wheels, 100 pounds Stone, 12 dozen Iron Locks, 1650 pounds Horse-Nails, 6 dozen Axes, 12 dozen Lanterns, 25 dozen Axes, 4 Corn-Shellers, 1 dozen Hay-Knives, 1 dozen Trucks, 1 gross Polish, $\frac{1}{2}$ gross Grease, 3 cases Hardware.

By Welsh & Lea.—4 cases Hardware, 3 cases Saws, 1 case Springs.

By R. W. Forbes & Son.—8 cases Finishing-Nails, 10 Stoves, 6 cases Nails, 7 packages Corn-Shellers, 1 case Bird-Cages, 20 dozen Rakes, 150 dozen Axe-Handles, 1 barrel Plated-Ware, 3 dozen Wringers.

PER BARK CASSANDRA, NOVEMBER 14, 1889, FOR ADELAIDE, AUSTRALIA.

By H. Disston & Sons.—545 pounds Hardware.

By Rogers, Smith & Co.—4 packages Plated-Ware.

By L. D. Crossmond & Co.—5029 pounds Agricultural Implements.

By Meriden Britannia Company.—4 boxes Plated-Ware.

By A. Field & Co.—12 gross Whips, 19 dozen Harness-Ware.

By Edward Miller & Co.—19 packages Lamp Goods, 3 barrels Lamp Goods.

By Strong & Trowbridge.—150 dozen Axe-Handles.

By Welsh & Lea.—5 cases Hardware, 2 cases Glue, 2 cases Iron Bolts.

By Mailler & Quereau.—3 cases Machinery.

By R. W. Forbes & Son.—2 boxes Hardware, 12 packages Axle-Grease, 1 package Agricultural Implements, 14 packages Axle-Grease, 1 package Hardware.

By McLean Bros. & Rigg.—3 dozen Harrows, $2\frac{1}{2}$ dozen Pumps, 1 dozen Money-Drawers, 9 dozen Locks, $2\frac{1}{2}$ dozen Carpet-Stretchers, $4\frac{1}{2}$ dozen Flint-Paper, 12 sets Axes, $\frac{1}{2}$ dozen Drills, 3 dozen Hammers, 3 dozen Files, 3 dozen Clamps.

By Arkell & Douglas.—2 cases Saws, 350 reels Barbed Wire, 5 cases Rakes, 18 cases Axes, 15 packages Lamp-Ware, 6 cases Saws, 24 cases Meat-Choppers, 15 packages Hardware, 3 cases Hoes, 4 boxes Axes, 4 cases Perambulators.

By H. W. Peabody & Co.—21 packages Stoves, 8 cases Wringers, &c., 1 cask Pumps, 14 cases Lamp-Ware, 44 cases Metallic Cartridges, 48 cases Hardware, 1 case Padlocks, 1 case Vises, 41 packages Hardware, 1 case Agricultural Implements, 2 cases Oil-Stones and Fixtures, 1 case Agricultural Implements, 1 case Perambulators, 8 cases Hardware, 1 case

Agate-Ware, 6 Wringers, 2 crates Stoves, 27 dozen Traps, 2 cases Stamped-Ware, 1 case Oil-Stoves and Wicks, 2½ dozen Wringers, &c., 26 packages Lamp-Ware, 2 cases Castings, 7 cases Agate-Ware, 6 dozen Glue, 64 packages Hardware, 1 bundle Stencils, 6 dozen Lawn-Sprinklers, 19 crates Stoves, 1 case Fire-Arms, 3 cases Carriage-Ware, 5120 pounds Car-Wheels, 3 dozen Wash-Boards, 24 packages Wash-Boards, 3 cases Edge-Tools.

PER BARK OSMAN PASHA, NOVEMBER 14, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By Arkell & Douglas.—7 Wagons, 9 dozen Chisels, 30 dozen Scales, 20 Scales, 24,500 pounds Nails, 20 dozen Picks, 6 dozen Meat-Choppers, 2 Wagons, 40 Stoves, 6 dozen Parers, 1 Cart.

PER BARK ILARA, NOVEMBER 15, 1889, FOR PORT NATAL, SOUTH AFRICA.

By W. H. Crossman & Bro.—60 gross Shears, 4 dozen Churns, 3 dozen Store-Trucks, 6 dozen Scales, 698 dozen Tools, 30 dozen Wash-Boards, 10 Mangles, 1 dozen Washing-Machines, 20 Road-Scrapers, 96 dozen Wrenches, 8 dozen Perambulators, 6 dozen Ladders, 7 crates Hardware, 100 Plows and Parts, 3 dozen Store-Trucks, 1 dozen Corn-Shellers, 3 cases Tools, 30 dozen Brushes, 16 Stoves, 1½ dozen Scales, 20 dozen Wrenches, 110 dozen Tools, 8 Cultivators, 14 dozen Tools, 8 Plows and Parts, 30,000 pounds Barb-Wire.

A Commodious Office.

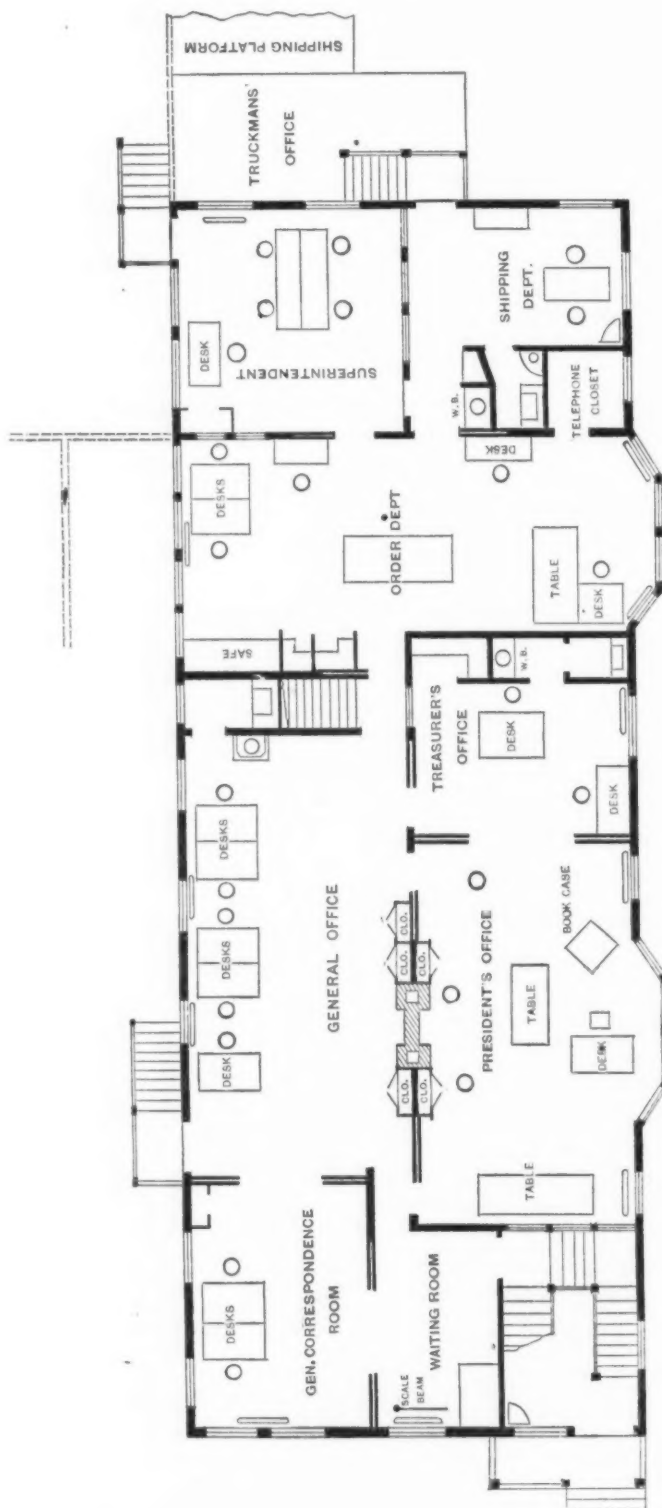
A well-arranged office with modern conveniences and an abundance of space is something that office employees very generally enjoy. It is something, too, that proprietors are beginning to appreciate on account of its business value. The idea that any place is good enough for the book-keeper or corresponding clerk is gradually being superseded by the other and better notion that every workman, whatever his line, can render better service and more easily earn his salary by having the proper facilities with which to work. The engravings on this page represent the floor-plans of the new offices recently fitted up by the A. A. Griffing Iron Company, Jersey City, N. J., manufacturers of the well-known Bundy Radiators. Neither trouble nor expense has been spared in arranging this building and adapting it to the purpose in view. The business of the company ranks among the largest of its kind in the world and has increased to such proportions as to render necessary the new office accommodations referred to.

The approach to the works leads the visitor to the stair-way and vestibule shown at the extreme left in the first-floor plan. This floor is elevated above the ground enough to make a good basement story under the office building and to place the general offices at a pleasing height. The basement is practically a fire-proof vault for the storage of patterns. These are of the most expensive kind, as may be inferred from the finish of the radiators which they produce. Ascending the stairs, the visitor finds himself in a small waiting-room, in which also is the scale-beam from the platform-scales just outside the building across which the pig-iron, coal, coke and other materials required in the factory pass on their way to the works. The entrance is into the general office, although there is a pair of double doors between the waiting-room and the general correspondence room which might be opened if desired. In the general office are a number of desks, including one or two for typewriter operators. At the right is the president's office, which is a large, well-lighted and handsomely appointed room. The president's desk is located near the bay-window, as shown in the engraving. Near the center of the room is a library table, while just back of the president's chair is a revolving book-case. Other appropriate furnishings are employed, but are of a character scarcely to be indicated in a plan view. Communicating with the president's office is the treasurer's office, separated only by double sliding-doors. The order department,

which is a most important consideration in view of the fact that the business transacted by the company approximates \$1,000,000 a year, is located immediately back of the office already described and extends clear across the building. The superintendent's office and shipping department are immediately adjacent to this, while in turn, further back, in the form of an addition to the office building, is the truckmen's office. The dotted lines at

in view, considering the location and environment, is hardly to be conceived.

Going up-stairs, either by the stair-way leading out of the general office or from the front stairs out of the weighing-room, the visitor reaches the testing and sample room of the establishment, which occupies an important part of the second floor. Low platforms are arranged as indicated by the squares in the diagram, on which are placed different radiators, so arranged



A Commodious Office.—First-Floor Plan of Office Building Recently Erected by the A. A. Griffing Iron Co., Jersey City, N. J.

the top of the first-floor plan indicate, approximately, the connection of the office building with the main works of the establishment. The stairs out of the superintendent's office lead into one of the principal buildings of the factory. Directly back of the truckmen's office is a raised platform, being on a level with the floor of the factory, but still high enough to facilitate loading into the wagons for shipping. A more convenient arrangement and one better adapted for the ends

as to give the visitor or intending purchaser every opportunity of examining them in all their details. On that part of the second floor directly over the president's office is located the chemist's room. This may be described as a well-appointed laboratory. It is provided with every necessary form of apparatus. In it are tested the various materials that are used in the establishment, and various expert deductions are made as to relative values, &c. The mailing-room, which may be de-

scribed as the advertising department of the concern, occupies that portion of the second floor directly over the order department. In this room a considerable number of clerks are to be found at work, and the large amount of mail which is sent out each day fully justifies their presence. Incidentally it may be remarked that the company make use of 14 stenographers and type-writers and two graphophones. We have been told how many pounds of matter go out per week and how many letters are sent, but to repeat the figures here would fail to convey an idea of the magnitude of the business conducted. Nothing but personal inspection is adequate for this.

The book-keepers of the establishment are to be congratulated. They have a large, airy room at the rear of the second floor, with abundance of light and with ample opportunity for ventilation on every side. Comparing their work-room with those occupied by some of their fellows in the larger cities, they may be declared to be in clover, using a mild phrase. The safe for the books is located in one corner of this office, and immediately against it are the files which are devoted to the credit department. Here a very complete and com-

However, the indications are that the trade stands up well against the adverse influences and prices show remarkably slight variation. As far as Leads, Zincs and the staple lines of dry Colors are concerned, values remain very steady, in fact, despite the rather slow movement of stock into the channels of distribution.

White Lead.—No official announcement of any change in list prices or rebates has yet been made, and corrodors within and without the trust assert that they are adhering to the official figures, as far at least as net prices are concerned. Trade has been rather slow during the week. The new company—Standard White Lead Company—have been taking orders for their product and intend to make initial deliveries during the current month. Their quotation is 6.08¢ net for Lead in Oil.

Zincs.—Local distribution has been rather slow during the week and few contracts involving forward deliveries have been made, the large buyers, it is said, having made liberal provision for future wants. Prices for both American and foreign remain very steady.

Colors.—Trade in dry Colors has been of moderate volume, suffering in common

and there are some indications of a change for the better in the situation of Cotton-Seed-Oil, although no advance in prices.

Linseed-Oil.—Buyers of Raw Oil have confined their purchases chiefly to domestic seed product, paying 60¢ for city-made Raw Oil and 58¢ for Western, that variety being considered cheaper than the Calcutta seed Oil at 62¢, with all due allowance for superior quality of the latter.

The firm of J. A. Dean & Co. have been dissolved, and a company incorporated under the laws of the State of New York, with a capital of \$250,000. The stockholders are the members of the old firm, including Joseph A. Dean, Arthur Dean and Charles N. Manchester.

Cotton-Seed-Oils.—Crude has been meeting with very steady sale at prices on the basis of 28¢ for prime quality, and the refined Oils have had quite good movement also at previous prices. There has been no advance, but the market looks better, and higher figures are considered as likely to rule after the turn of the year.

Lard-Oil.—City pressers have enjoyed a good home-trade demand for their Oil and also more extensive export inquiry, the



Plan of Second Floor of A. A. Griffing Iron Co.'s Office Building.

prehensive system is employed. The financial and business standing of every man in the country who is likely to order any of the special goods manufactured by this concern is recorded in a way to give the managing man complete control of sales and at the same time permit his ratings and limits of credit to be recorded in a way to prevent any mistakes upon the part of subordinates. Further, the ability to watch the trade and to take advantage of any emergencies that may arise is fully provided for.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Rainy weather has interfered more or less seriously with building operations and thereby checked the distribution of Paints and Colors to a considerable extent. In point of fact business has been slow all along the line, and the results for the month prove to be unsatisfactory to manufacturer, importer, jobber and retailer.

with other painters' materials from the unfavorable weather. Some improvement was noted the last two days, however, in jobbers' sales. There have been no important changes in prices. Colors and Oil and ready-mixed Paints have likewise had rather slow sale, orders running small as well as being comparatively light numerically.

Miscellaneous.—There has been no change in the position of Whiting or Paris White, the demand being fair and prices steady. Barytes and Clays in general are steady.

Animal and Vegetable Oils.

Prices for nearly all goods in this line are showing decided firmness, and business is proceeding very smoothly, with the aggregate movement of supplies into the channels of consumption quite up to a full average volume for the season. Speculative influences have no bearing, directly or indirectly, in shaping the course of value at the present time. Strong position of crude materials, along with large home consumption and good export demand, are the governing influences. A rise of 2¢ in the cost of crude Sperm-Oil and a corresponding advance on the manufactured productions are the most conspicuous among the changes during the week, but Whale-Oils have advanced a trifle; Lard and Olive Oils have hardened,

whole serving to give the market decided firmness. Outside brands have also been selling fairly. On round lots of present-make prime 54¢ is bottom price and 1¢ over that is the rule on ordinary jobbing quantities.

Sperm-Oils.—Several lots of crude have been sold at 65¢ in the New Bedford market, which price shows 2¢ advance for the week. A corresponding rise in prices for the manufactured products is quoted, and the market is strong in tone, with demand fairly active.

Whale-Oils.—The supply of crude in first hands is light, and along with the smallness of the last season's catch that fact serves to keep prices very stiff. The demand for the Oil is fair.

Menhaden-Oils.—Crude is in fair request for export account and firm at previous prices. Pressed and Bleached Menhaden and Tanners' Oils are very steady and in good demand.

Olive-Oil.—Italian in barrels has stiffened up to 73¢ for round lots from first hands and 74¢ @ 75¢ for jobbing quantities, at which prices a very fair business has been done.

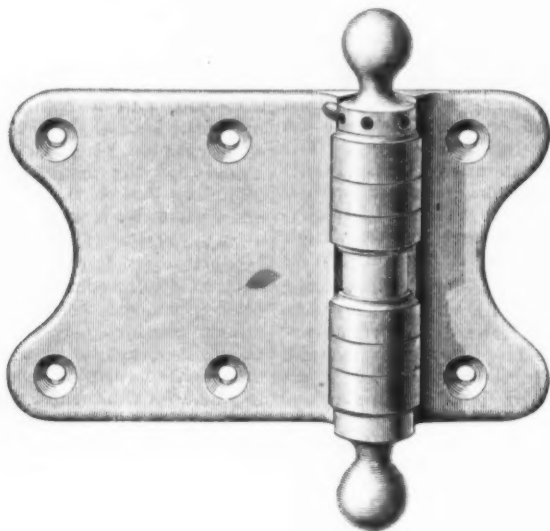
Cocunut-Oil.—Ceylon has been at 5½¢ @ 5½¢, ex-vessel, but for jobbing lots from store 5½¢ remains the general price. Cochin is steady at 6½¢ on the spot and 6½¢ to arrive.

Spring Hinge.

The accompanying illustration represents a new pattern of the well-known line of Gem spring hinges, manufactured by the Van Wagoner & Williams Company,

weight to the cord, as they can easily be hammered together so as to make a secure and compact fastening. The price of this fastener is referred to as no greater than that of the former cast fasteners. It can be used with small braided cord or with

in the illustration, but laid together with the notch reversed. To open it the link is pressed first into one notch and then around between the plates to the other. To close it the link is pressed between the plates, first into one notch and then around to the other. In this way the keys are easily strung and detached, while the



Spring Hinge.

82 Beekman street, New York. It is, as shown in the cut, a single-acting surface hinge. These hinges are especially designed to screw on marble for water-closet doors of hotels and office and public buildings, but are referred to as also adapted for other screen-doors. They can be made to throw a door open instead of closing it, if desired, and can be furnished with both flanges like either shown in the illustration when so desired. They are 3½ inches and furnished in real bronze or polished brass.

chain, but is designed more particularly for cotton or soft-laid cord.

Sure-Hold Planters' Hoes.

The accompanying illustrations represent hoes which are put on the market by the Sanford Fork and Tool Company, Terre Haute, Ind. The special feature is the manner in which the hoe is secured in the handle, a rivet passing through tang, ferrule and handle. This construction is



New Key-Holder.

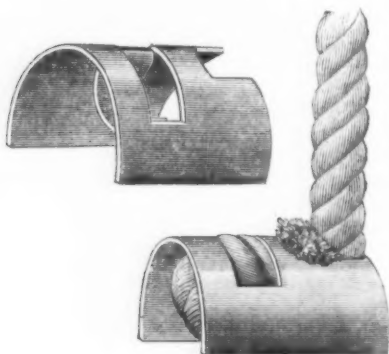
holder is secure and is not liable to get loose or out of order.

The Great File Invention.

When I lived in Chicago a queer chap invented a cheap way to make files. A bit of hot steel went into his machine and the file was made at a single blow and fell into a tank of strong mineral water to cool. Then a bare-armed workman thrust in his hand and felt around and brought it up for inspection. The files thus made were a little imperfect, but were good ones, and he explained that the machine was a small experimental one and could not, of course, do perfect work, as a large and powerful machine would. Capitalists went around and examined the machine and saw him heat the steel in a hand-forged and put it in the machine and saw the red-hot file come out and drop in the water, and

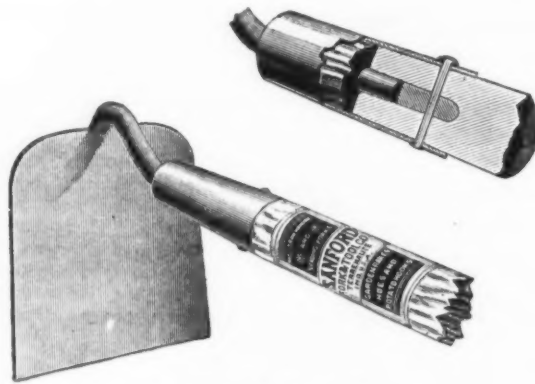
Sash-Cord Fasteners.

The accompanying illustration represents a new style of sash-cord fastener which is put on the market by Edwin W. Abbe, New Britain, Conn. This fastener is stamped out of sheet-steel in the form shown in one of the cuts, and after the cord has been placed between the tongue and the body of the fastener the tongue is hammered down in such a position as to hold the sash-cord securely. It is pointed out that this construction requires no tying of knots, while at



New Sash-Cord Fastener.

the same time the cord can be fastened more quickly and better, with economy also of cord. As it is made of steel it is practically indestructible and there is sufficient spring in it to hold it in place in the sash, so that it is not liable to work out and scratch the casing. These fasteners can also be used for attaching the



Sure-Hold Planters' Hoes.

possessed of obvious advantages and involves an expense of only 50 cents per dozen list extra.

New Key-Holder.

This article is made by the Ames Sword Company, Chicopee, Mass., and is put on the market to meet the demand for a less expensive key-holder than their Perfection, which, consisting as it does of ½-inch padlock attached to a chain and opened with a common pin, is somewhat expensive. Meeting, however, notwithstanding this fact with an extensive sale, the company have now patented a new article called the Trusty, which is represented in the accompanying cut. It is referred to as equally effective and much more simple and cheaper. It consists of two German-silver plates having each a notch, as shown

they tried the file with their own hands on iron which they had brought from home and found it excellent. The only secret was the chemical water into which the files dropped and which gave them edge. A company was formed and money was paid in freely to enable the inventor to make a set of large machines, and when that was done he disappeared. It was a fraud. He had bought good files and defaced them a little and stocked his tank with them. His machine stamped the bit of steel into the file-sharpeners, and it dropped into the water with the files, and his workman, who was in collusion, felt around and brought up a file instead of the steel.—Portland Argus.

Bismarck has introduced a bill in the German Bundesrath to give \$225,000 a year toward maintaining a regular steamship service to the East African coast.

Crary's Patent Bin and Sifter.

By means of the accompanying illustrations we show an interesting kitchen novelty which is being introduced to the trade by the Middleport Bin and Sifter Company, of Middleport, Ohio. The manufacturers claim that this device does away

cocks, which are liable to get out of order in a short time and leak, as they are made of metal with a metal plug, which soon cuts out. It is then necessary that the entire pump be taken up and a new three-way valve put in. In the one illustrated herewith it is pointed out that the only wearing part is the leather valve held

2 shows a portion of the outside casing and of the outside sash and the manner in which the fasteners are applied. In using these fasteners the sash are fitted to the frames so that they will go in easily when the bushings by means of a $\frac{3}{4}$ -inch bit are inserted in the casings, the hole being bored 7-16 inch from the outside edge, and the lip of the bushing turned outward and set in even with the surface. The sash is placed firmly against the casing and the fasteners attached by means of screws exactly opposite the center of the bushing. The fastenings are attached with a back against the casing, handle up, as seen in Fig. 2, and when the handle is turned down the eccentric of the fastener engages with the bushing, thus making a secure fastening. It is also pointed out that with this fastening, if the sash is made in two or more sections hinged together at the line of division, a part of the sash may be swung outward for



Fig. 1.—General View.

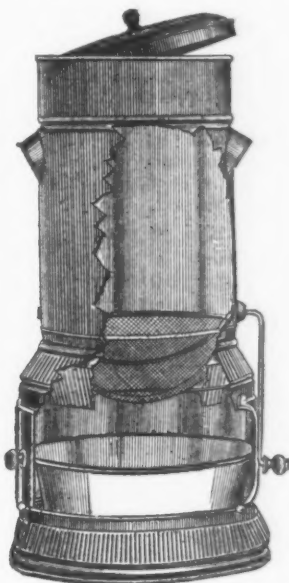


Fig. 2.—Broken View of Article, Showing Interior Construction.

with the old woden bin and keeps the flour free from dust and other substances which often find access to flour-bins as ordinarily arranged. It also prevents, when in use, the flour from becoming scattered about the table and floor, and results in the saving of both time and labor. The device is at present made in two sizes, holding respectively 30 and 50 pounds of flour. It is constructed of the best quality of tinplate and neatly japanned and decorated. Referring to the engravings, Fig. 1 shows a general view of the device, while Fig. 2 presents a broken view clearly indicating the interior arrangement of parts.

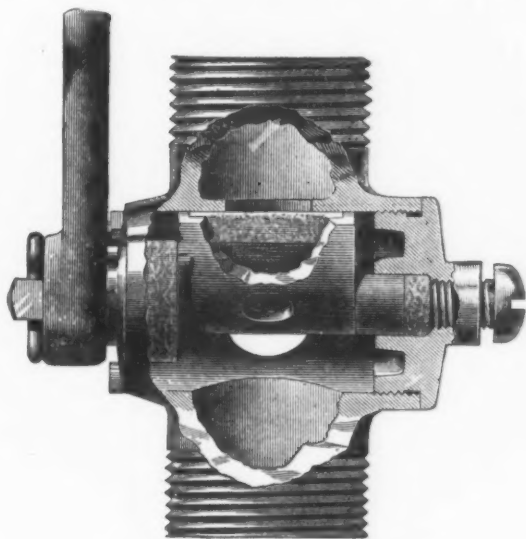
Patent Adjustable Three-Way Cock.

The accompanying illustration represents this article, which is manufactured by the Red Jacket Pump Company, Dav-

by spring brass and water-pressure, a construction which is referred to as likely to wear a good many years before requiring a new packing. When necessary, however, a new packing can be put in without taking the pump apart or unscrewing any joints and at little expense. This is accomplished by removing the cotter from crank and unscrewing the large cap on the opposite side, when the entire working parts can be removed without taking the pump apart. We are advised that they have been found entirely satisfactory in practical use.

Brook's Outside Window-Fasteners.

The accompanying illustrations represent a line of outside window-fasteners which is manufactured by Eastern Mfg. Co., Boston, Mass., for whom Bigelow &



Patent Adjustable Three-Way Cock.

enport, Iowa. It is put on the market to meet the demand for such an article which is not subject to the objections which hold in regard to other three-way

Dowse, 229 Franklin street, Boston, are sole agents. Fig. 1 represents these fasteners separately, showing also the socket or bushing with which they engage. Fig.

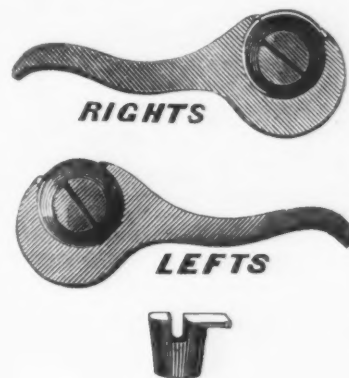


Fig. 1.—Brook's Outside Window-Fastener.

ventilation. It is also explained that the sash can be raised from the ground to any desired height by dropping a line from the window to which it is to be attached and passing it around one of the fasteners on either side of the sash to which they are attached and lowered in like manner. The fastener, by setting the bushing in the

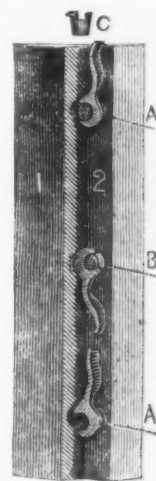


Fig. 2.—Fasteners Applied to Window.

edge of the sash and securing the fastener to the casing, is referred to as well adapted for use in mills and shops where the sash is fastened to the inside instead of the outside casing, and by this means the whole sash may be secured in much less time than is required by the old method. The point is especially emphasized that windows with these attachments affixed are put on from the inside instead of the outside of the building by putting the window out over the top sash, thus obviating the use of steps or ladders in putting on or removing them.

Elterich's Short Taps, Tap-Wrench, &c.

Charles Elterich, 191 and 193 Worth street, New York, is putting on the market a short tap which is represented in the accompanying illustration, Fig. 1. The wrench in which it is used is shown in Fig. 2. This tap is without the usual shank and constructed so that when held in the wrench or tapping-chuck the thread

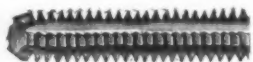


Fig. 1.—Elterich's Short Tap.

projects the same length as the regular tap with shank. These taps can also be used from either end, so as to make taper and bottoming tap or plug and bottoming tap. It is also pointed out that this short tap is stronger than the regular tap with shank, and that being shorter it can be more uniformly hardened and tempered and remain straighter, thus securing better quality and economy. In addition to these advantages it is pointed out that these taps can be sold at a lower price than the regular style, and this fact, combined with the advantages above referred to, is regarded as securing for them a most favorable reception. They are covered by a patent, October 15, 1889.



Fig. 2.—Tap-Wrench.

The wrench (Fig. 2) is described as made of the best material of well-tempered steel and strongly constructed. It will hold all taps from numbers 1 to 14, inclusive. The cut represents the wrench half-size, and besides its adaptability for holding the short taps shown in Fig. 1, it is also useful for holding broken taps of sufficient length. The fact that the nut or sleeve is long furnishes an excellent grip for the hand in tightening, and it is stated that it will not slip out of the thread after being in use any length of time. Fig. 3 represents Elterich's Improved Tempered Dies for screw-cutting, which are described



Fig. 3.—Elterich's Improved Tempered Dies.

as so tempered that the teeth or threaded portion are hard while the rest is soft, thereby avoiding breakage, even if the die be excessively expanded or contracted. We are advised that they have been in constant use for the last nine months, undergoing severe tests on all kinds of material, and that not one of

them has been found defective. They are sold with the highest guarantee of their quality.

The *Phoenixville Republican* reports that the Phoenix Iron Company have begun work on an enlargement of their plant, which will make them "the largest open-hearth steel plant east of the Alleghenies."

Mr. Lehman, of Naylor & Co., New York, who has been establishing agencies in the West, has secured the services of Mr. Guthrie and Mr. Isely, both young men of ability, to sell the product of the Tennessee Coal, Iron and Railway Company, acting under instructions from J. J. Gray, of Cincinnati.

Hiram Veasey, of the firm of Bevins Brothers, bell manufacturers, died at his home in East Hampton, Conn., on the 23rd inst., aged 73 years.

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Cooking and Heating Stoves Abroad.

BY WILLIAM J. KEEP.

(Continued from Page 834, November 21.)

THE COOKING RANGES OF BELGIUM.

There is a great similarity between these and French ranges, but as a general thing they are better proportioned. As fuel is not so dear the fire-boxes are somewhat larger, but not as large as those used in the United States. In these ranges the fire-boxes are generally round, while in France they are square. They are dropped in through the top cooking hole as in French ranges. In Belgium we find more attention given to decoration, many of the ranges having both sides and front covered with tiles, and the entire surface of the doors polished. Even the smaller ranges show that care has been taken in proportioning their parts.

The ash-pans are very small, as was the case in France, showing that it is expected that but little fuel shall be burned. Many ranges have their smoke-pipe covered with polished brass, and in most cases the polished parts are kept very bright, showing, as we have before remarked, that much is thought of appearances. Cast-iron enters more into the construction of Belgian ranges than those of France.

THE RANGES OF GERMANY.

So far as we could see, the shape of the fire-box was about like that of American ranges but smaller, and it was long and narrow. The grates had stationary bars running from end to end. The outside of the ranges was generally of cast-iron, while the ovens were of wrought-iron, and the general proportions good. These ranges had more holes in the top for cooking than French ranges. The most of the goods that we saw were made in Westphalia, the iron produced there being suitable for stove castings.

Ranges covered with tile are very common and popular. The workmanship is very good.

While in Crefeld we called upon the agent of the Michigan Stove Company and found a Garland range in the show-window and others in the store. Here was a large assortment also of German ranges, so that we could conveniently make comparisons. The cost of transportation of American stoves is about equal to the first cost of the goods. A No. 21 Champion Garland range was marked at \$100, while a German range of equal capacity was marked at \$50.

Those who used our ranges baked their own bread and did other cooking well, while those using German ranges bought their bread and pastry, and although our fire-boxes are larger, yet our ranges are said to be more economical in the use of fuel, and it is considered good economy to pay the double price charged for them.

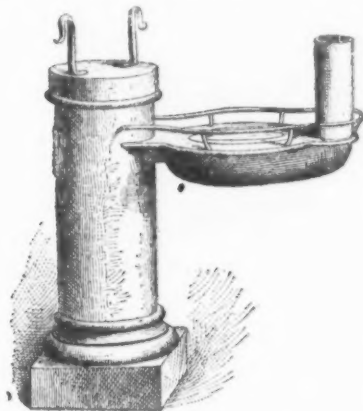
As we said regarding the English and French ranges, the custom of patronizing the baker has caused less attention to the oven, and the public taste is for dishes that can be cooked without heat on the oven bottom. One of the best illustrations of the adaptation of a stove to the wants and habits of the people is the cooking stove used by the better class of working people. Those that we saw were in the houses of the silk-weavers in Crefeld. These people can afford to use but little meat and wish to boil what they do use. These stoves (Fig. 15) were cylindrical, with a sheet-iron body lined with fire-brick. There is a front door for feeding and the whole top lifts off if required. The fire passes into a peculiar-shaped rear horizontal flue which broadens out until its top is about circular. In the center of this top is a hole of about 10 inches diameter, with four or five contracting-rings and the usual small center cover. Back

of this hole is the smoke-pipe. The top of the stove has a handle riveted to it for lifting off. Around the top of this flue is a rail to prevent articles from sliding off the top. The molded base of this stove is of cast-iron and is polished, and this, the edge of the top, the handle and the rail are kept as bright as when new.

In many of the houses we saw a tea-kettle, tea-pot and other utensils of bright brass over a sink near the stove. On the other side of the long room was a row of three or four silk looms with just room to easily pass between them and the stove.

THE RANGES OF HOLLAND.

We here find a large number of the cooking stoves last described, only instead of a straight brick-lined pot a small globe-shaped cast-iron fire-pot (Fig. 16), with a



Cooking and Heating Stoves Abroad.—Fig. 15.—German Cook Stove in Silk-Weaver's House at Crefeld.

round grate in its lower end, is placed midway between the top and bottom of the cylinder. Only a very small fire of peat or charcoal or of English soft coal is used. Holland having originally been wholly reclaimed from the sea has no fuel except from the extensive peat beds near the line between it and Germany, and this scarcity of fuel leads to the location of the fire in the stove as near as possible to the cooking-hole. The cooking-hole has no rings and is closed by a sheet-iron cover with a handle riveted to it. Besides this kind of stove a square range (Figs. 17 and 18) is used, of a most peculiar construction. It is made of quite thin sheet-

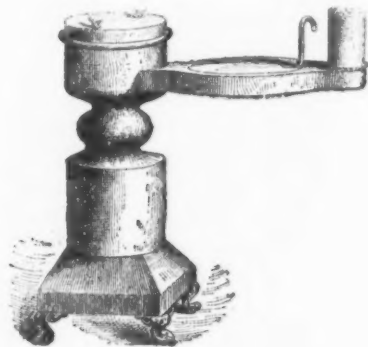


Fig. 16.—Holland Cook Stove.

iron, all but the top fire-box and grate, which are of cast-iron and consist of a rectangular box with a horizontal diaphragm about 3 inches below the top. From this diaphragm to the bottom and about two-thirds from the left end is an upright wall of sheet-iron. The space on the left of this wall is the oven and in the front is cut a hole for the door. On the right is the ash-pit and a hole is cut in the lower part of the front to allow a very small ash-pan to be slipped in. In the dia-

phragm above the ash-pan is cut a round hole to receive a circular bowl-shaped fire-pot, which hangs by its upper flange, a grate resting on its lower flange. One hole in the top allows this fire-pot to be put in place and serves for feeding the fire. The cover to this hole has a wrought-iron

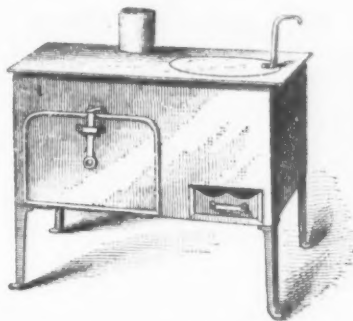


Fig. 17.—Square Cooking-Range Seen in Rotterdam.

handle riveted to it, and being of sheet-iron has riveted on its under side a welded ring of wrought-iron to stiffen its edge. There are no flues around the oven and the fire passes directly up the smoke-pipe, heating only the hot-plate and the top of the oven.

THERE ARE NO FIRMS MAKING STOVES IN HOLLAND.

Their construction is the work of the blacksmith. We visited one of these and he had a range partly made in his shop. The shop is in the front room of the blacksmith's house, opening directly off from a very narrow sidewalk. On this walk along the narrow street the women were sitting preparing either vegetables for the next meal or knitting or sewing. The blacksmith's wife was in a room open-

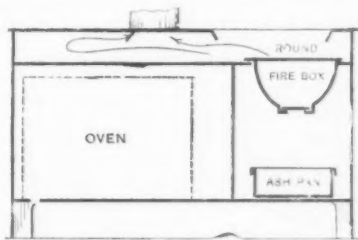


Fig. 18.—Section of Square Range Shown in Fig. 17.

ing out of the shop, and when he needed a helper he called her out to strike the heavy blows with the sledge. When he saw that we were interested in his stove he brought a door from one place and a latch from another to show what the range would be when done. Everything is made by hand and all polishing is done by fine files.

It is evident that the ovens of these ranges are no better than American warming-closets, the heat coming only from the top, but it seems to be all that is required.

This is proved by the following experience: While we were being entertained at the house of the American consul during our last evening's stay in Rotterdam I expressed surprise at the finely-prepared eatables when their ranges had no flues. The consul's secretary kindly took me into the kitchen, where a woman cook of more than ordinary intelligence had just finished her work. I was much disappointed to see a Belgian range (Fig. 19) of excellent construction, with as good flues as any American range. We found both dampers closed off, so that no heat could get under either oven, and the direct opening into the pipe was open, allowing all heat after passing over the top of the ovens to go directly out into the chimney. An

open-work oven-rack was placed about 3 inches above the bottom of each oven. As we saw considerable ashes under these racks I asked the cause, the secretary acting as interpreter, and found that the cook placed ignited peat under the racks when she wished to bake anything on the bottom which had been placed on the oven-racks. When asked if she did not know that the heat from the fire-box could be made to go under the oven bottom, she indicated that she wanted the heat to go up the chimney and preferred to bake with peat coals.

These people are perfectly satisfied with everything as they have it, and have adapted their tastes to the kind of cooking that can be done on their stoves.

With the exception of a few towns it would not be worth the while to try to introduce our better American goods, for, as in the above case, they do not use the good goods that they already have.

HEATING STOVES.

In the countries visited by us, heat for warmth is not as essential as in America. The weather in summer is not as warm as

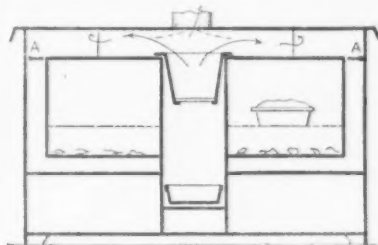


Fig. 19.—Section of Belgian Range in House of American Consul at Rotterdam.

with us and the temperature is not subject to the variations that are experienced in this country. The temperature in winter is not cold enough for freezing as a general thing, although in Germany and Holland it is colder. The people dress warmer in summer than we do and eat food which is much more heating, and for these reasons a much lower temperature is required in the houses than in America. Therefore heating stoves are of a simple construction, more to take the chill from the



Fig. 20.—Stove at New Bath Hotel, Matlock, Bath.

air than to maintain a constant heated atmosphere.

The one idea that seems uppermost in stove construction in Europe is to so form the stove that it shall be noticed as little as possible and that it shall be a pleasing piece of furniture.

ENGLISH STOVES.

In Central and Southern England artificial heat is obtained almost universally from open coal grates in fire-places. As we have said, the heat for the living-room

of the middle classes and all of the heat for the poorer classes is from the open fire of the cooking range. Every other room where heat is needed is fitted with a grate, where an open fire can be started to remove chill or dampness. Very rarely is a stove found, unless in a room which has no fire-place. In the Midland depot at

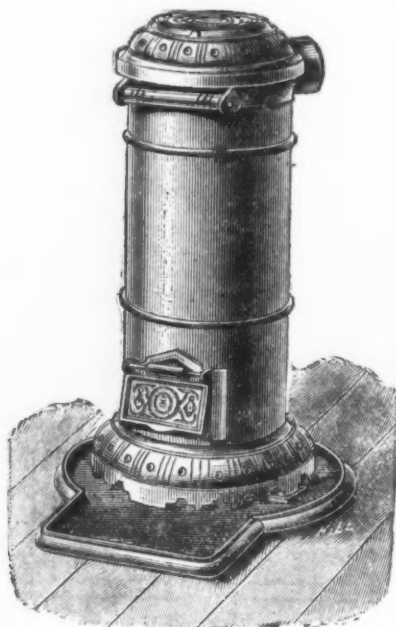


Fig. 21.—Plain Slow-Combustion Stove without Extra Casing.

Liverpool the waiting-rooms are heated by iron fire-places set in the middle of the room and with a flue down the back connecting with a flue under the stone floor leading to a chimney. In the new Bath Hotel, at Matlock, we found a stove (Fig. 20) in the hallway to be lighted on cold days. Hot water is the almost universal method of heating large buildings and the better dwellings as with hot-water radiators a very slight or a greater warmth can be imparted. In the colder parts of England and Scotland where the hot-water system is too expensive or is inconvenient to apply, slow-combustion stoves are used.

This stove (Fig. 21) is constructed like our cheapest direct-draft stove, except

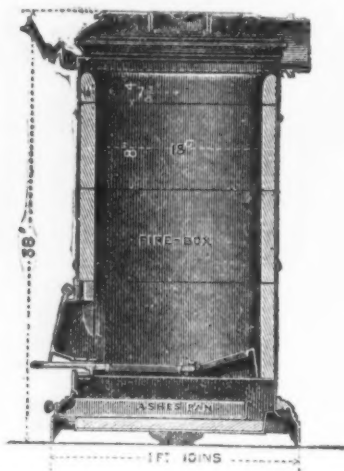


Fig. 22.—Section of English Slow-Combustion Stove.

that the brick linings extend nearly to the top (Fig. 22). Some of these stoves have a door for feeding coal near the top in front like ours, but many are fed wholly from the top. The stove is intended to be filled with gas coke or with anthracite

coal and set on fire and then closed off as close as possible and not allow gas to escape. The grate of these stoves is made to shake and they are generally made with the center to draw out to discharge clinkers.

It is a rare thing for these stoves (Figs. 23 and 24) to have revertible flues. The noticeable thing about this class of stoves is a separate outside jacket to give the stove a presentable appearance. The cold air from the floor is drawn up between this casing and the stove (Fig. 25) and out of the openings at the top into the room again, thus preventing the outside surface from being so hot as to scorch anything touching it. These jackets generally cost more than the stoves which they cover. The cheaper form in England is composed of

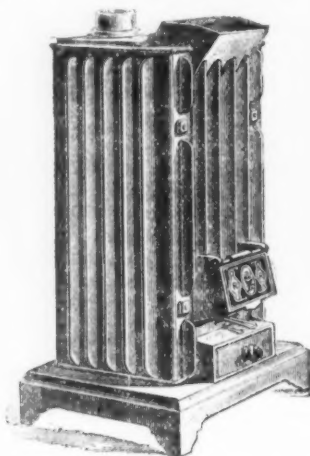


Fig. 23.—Slow-Combustion Stove Ready for Casing.

cast-iron fret-work (Fig. 26) more or less elaborately designed. When it has been put together complete it is painted with Berlin black and put into an oven heated

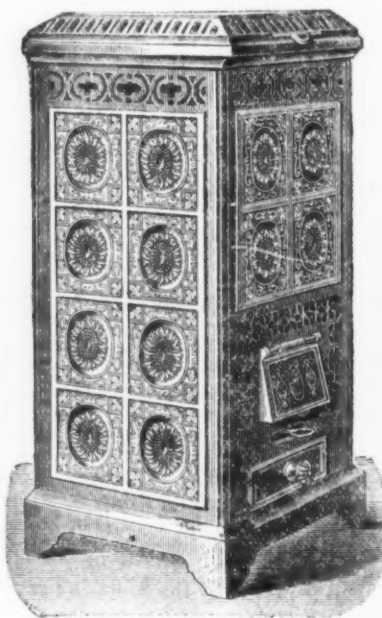


Fig. 24.—Slow-Combustion Stove with Tile Casing.

to a temperature higher than the varnish is expected to be heated in use. These casings are often trimmed with bronze or other decoration and may be surmounted with marble or tile tops. These stoves seem to exactly suit the English people and certainly have much to commend them.

AMERICAN STOVES HAVE AN ENVIABLE REPUTATION IN ENGLAND, and it is noticeable that many manufacturers compare their goods with American

stoves. We suspect, however, that very few English stove-dealers know how good a thing a modern American stove is, and that their comparisons are really made with the stoves made in Scotland from patterns



Fig. 25.—Section of Slow-Combustion Stove with Tile Casing.

taken from America 40 or more years ago. We saw such stoves and did not see a reproduction of a single good American stove. We saw quite a number of Art Garlands on sale in London, furnished by the London house of the Michigan Stove Company, but they gave too much heat for the requirements of the English people.

The impression gained by Americans that English stoves are behind the times is hardly correct. We think it would not be difficult to improve their stoves, and yet we found that the manufacturers in England and Scotland are as wide-awake regarding improvements as we are, and

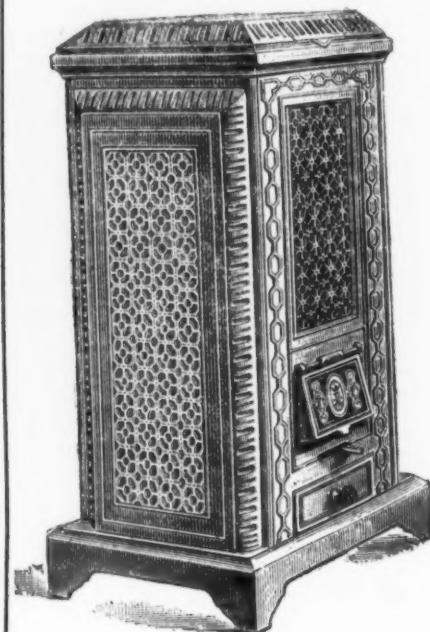


Fig. 26.—Slow-Combustion Stove with Iron Casing.

that the cause for the difference between their goods and ours is the difference in the requirements of the people of the two countries.

(To be continued.)

CURRENT HARDWARE PRICES.

NOVEMBER 27, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.	
F. L. Waterproof, 1-10's.	34@35¢
E. R. Trimmed Edge, 1-10's.	40@41¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.	46@47¢
Musket Waterproof, 1-10's.	50¢
G. D.	28¢
S. R. Genuine Imported.	45¢
Eley's F. B.	54¢ @ 55¢
Eley's D Waterproof, Central Fire.	\$1.00

Cartridges.

Rim Fire Cartridges.	50¢ & 52¢
Rim Fire Military.	25¢ & 52¢
Cent. Fire, Pistol and Rifle.	25¢ & 52¢
Cent. Fire, Military and Sporting.	15¢ & 52¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal.	1.75
Blank Cartridges, 32 cal.	2.25
Primed Shells and Bullets.	15¢ & 52¢
B. B. Caps, Round Ball, 1.75.	2¢
B. B. Caps, Con. Ball, Swgd., 2.00.	2¢

Primers.

Berdan Primers, 1.00.	2¢
B. L. Caps (for Sturtevant Shells) 1.00.	2¢
All other Primers, 1.20.	2¢

Shells.

First quality, 4, 8, 10 and 12 gauge.	25¢ & 10¢ & 2¢
First quality, 14, 16 and 20 gauge (10 list).	30¢ & 10¢ & 2¢
Star, Club, Rival and Climax brands.	20¢ & 10¢ & 2¢
Setbold's Comb. Shot Shells.	15¢ & 2¢
Brass Shot Shells, 1st quality.	60¢ & 2¢
Brass Shot Shells, Club, Rival, Climax.	65¢ & 2¢
I X L, 10 and 12 gauge.	40¢ & 5¢ & 2¢
"Special," 16 gauge.	30¢ & 10¢ & 5¢ & 2¢
"Special," 10 and 12 gauge.	40¢ & 10¢ & 2¢
Fowler's Pat.	\$3.25

Shells Loaded.

Standard. List.	40¢ & 40¢ & 10¢
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Wads.

U. M. C. & W. R. A. - B. E., 11 up, 2.00	
U. M. C. & W. R. A. - B. E., 9&10, 2.30	
U. M. C. & W. R. A. - B. E., 7&8, 2.60	
U. M. C. & W. R. A. - P. E., 11 up, 3.10	
U. M. C. & W. R. A. - P. E., 9&10, 4.00	
U. M. C. & W. R. A. - P. E., 7&8, 4.90	
Eley's B. E., 11 up.	\$1.75
Eley's P. E., 11 up.	2.80

Anvils.

Eagle Anvils, 10¢	20¢ & 20¢ & 5¢
Peter Wright's	10¢
Armstrong's Mouse Hole.	83¢
Armstrong's Mouse Hole, Extra.	11¢ @ 11¢
Trenton.	94¢ @ 94¢
Wilkinson's.	94¢ @ 10¢
J. & Riley Carr, Pat. Solid.	11¢ @ 11¢
Moore & Barnes Mfg. Co.	33¢

Anvil Vise and Drill.

Millers Falls Co., 1.00.	20¢
Cheney Anvil and Vise.	25¢
Allen Anvil and Vise, 3.00.	40¢ & 10¢

Apple Parers.

Advance.	1/2 doz \$4.75
Antrim Combination.	1/2 doz 5.50
Haldwin.	1/2 doz 5.25
Champion.	1/2 doz 7.25
Daisy.	1/2 doz 4.00
Eureka, 1888.	1/2 doz 12.00
Family Bay State.	1/2 doz 5.00
Favorite.	1/2 doz 5.25
Gem.	1/2 doz 4.00
Gold Medal.	1/2 doz 4.00
Ideal.	1/2 doz 4.00
Improved Bay State.	1/2 doz 30.00
Little Star.	1/2 doz 4.50
Monarch.	1/2 doz 13.50
New Lightning.	1/2 doz 5.50
Oriole.	1/2 doz 4.00
Penn.	1/2 doz 4.00
Perfection.	1/2 doz 4.00
Pomona.	1/2 doz 4.00
Rocking Table.	1/2 doz 8.00
Turntable.	1/2 doz 4.50
Victor.	1/2 doz 13.50
Waverly.	1/2 doz 4.00
White Mountain.	1/2 doz 4.50
72.	1/2 doz 4.25
76.	1/2 doz 5.75
78.	1/2 doz 6.50

Augers and Bits.

Douglas Mfg. Co.	
Wm. A. Ives & Co.	
Humphreysville Mfg. Co.	70%
French, Swift & Co. (F. H. Beecher)	
Rockford	
Cook's, Douglas Mfg. Co.	55%
Cook's, N. H. Copper Co. 50¢ & 10¢ & 50¢	
Ives' Circular Lip.	60%
Patent Solid Head.	30%
C. E. Jennings & Co., No. 10, extension.	40%
C. E. Jennings & Co., No. 30.	60%
C. E. Jennings & Co., Auger Bits, 1/2 set.	32 1/2
quarters, No. 5, 85; No. 30, \$3.50, 20%	
Lewis' Patent Single Twist.	45%
Russell Jennings' Augers and Bits.	25%
Imitation Jennings' Bits.	60¢ & 60¢
Pugh's Black.	20%
Rockford, Jennings' Pattern.	60%
Car Bits.	50¢ & 10¢ & 60%
L'Hommedieu Car Bits.	15¢ & 10¢
Forstner Pat. Auger Bits.	10¢
Cincinnati Bell-Hangers' Bits.	30%

Hollow Augers.

Ives'	
French, Swift & Co.	33 1/2 @
Douglas'	33 1/2 @ 10%
Bonney's Adjustable, 1/2 doz \$48.	40¢ & 10%
Stearns'	20¢ & 10%
Ives' Expansive, each \$4.50.	50¢ & 5%
Universal Expansive, each \$4.50.	20%
Wood's.	25¢ & 25¢ & 10%
Cincinnati Adjustable.	30¢ & 30¢ & 5%
Cincinnati Standard.	25¢ & 10%

Expansive Bits.

Clarks' small, \$18; large, \$29.	35¢ & 35¢ & 5%
Ives' No. 4, 1/2 doz \$60.	40%
Swan's.	40%
Steer's No. 1, \$26; No. 2, \$22.	35%
Stearns' No. 2, \$48.	20%

Gimlet Bits.

Common.	1/2 gross \$2.75 @ \$3.25
Diamond.	1/2 doz \$1.10.
Bee.	25¢ & 25¢ & 5%
Double Cut, Sheppardson's.	45¢ & 45¢ & 10%
Double Cut, Ct. Valley Mfg. Co.	30¢ & 10%
Double Cut, Hartwell's, 1/2 gross.	\$5.25
Double Cut, Douglass.	40¢ & 10%
Double Cut, Ives.	60¢ & 60¢ & 10%

Bit Stock Drills.

Morse Twist Drills.	50¢ & 10¢ & 5%
Standard.	50¢ & 10¢ & 5%
Cleveland.	50¢ & 10¢ & 5%
Syracuse, for metal.	50¢ & 10%
Syracuse, for wood (wood list).	30¢ & 30¢ & 5%
Williams' or Holt's, for metal.	50¢ & 10¢ & 10%
Williams' or Holt's, for wood.	40¢ & 10%
Cincinnati, for wood.	30¢ & 5%
Cincinnati, for metal.	40¢ & 10%

Ship Augers and Bits.

L'Hommedieu's.	15¢ & 10¢ & 15¢ & 10¢ & 5%
Watrous's.	15¢ & 10¢ & 15¢ & 10¢ & 10%
Snell's.	15¢ & 10¢ & 15¢ & 10¢ & 5%
Snell's Ship Auger Pat'n Car Bits.	15¢ & 10¢ & 15¢ & 10¢ & 5%

Awl Hafts.

Sewing, Brass Fer. 1/2 gr, \$3.50.	45¢ & 10%
Pat. Sewing, Short, \$1.00 1/2 doz.	4¢ & 10%
Pat. Sewing, Long.	1/2 doz \$1.20
Pat. Peg, Plain Top, 1/2 gr \$10.00.	45¢ & 10%
Pat. Peg, Leather Top, 1/2 gr \$12.00.	45¢ & 10%

Awls, Brad Sets, &c.

Awls, Sewing, Common.	1/2 gr \$1.70, 35%
Awls, Should. Peg, 1/2 gr \$2.45.	40¢ & 10%
Awls, Pat. Peg, 1/2 gr 63¢.	40¢ & 10%
Awls, Shoulders, Brad, 2.70 1/2 gr.	35%
Awls, Handled Brad, 2.70 1/2 gr.	45%
Awls, Handled Scratch 1/2 gr, \$7.50.	35¢ & 10%
Awls, Socket Scratch, 1/2 doz, \$1.50.	25¢ & 30%

Awl and Tool Sets.

Allen's Sets, Awls and Tools.	
No. 20, 1/2 doz \$10.00.	55¢ & 10%
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9.	25¢ & 25¢ & 10%
Miller's Falls Adj. Tool Hds.	
Nos. 1, \$12; 2, \$18.	25%
Henry's Combination Haft.	1/2 doz \$6.50
Brad Sets.	
No. 42, \$10.50; No. 45, \$12.50.	70¢ & 10¢ & 5%
Stanley's Excelsior.	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.	30¢ & 10%

Axes.

Makers' and Special Brands.

First quality.	1/2 doz \$6.00 @ \$6.50
Others.	1/2 doz \$5.50 @ \$5.75

Axle Grease.

Fraser's.	1/2 Keg 1/2 doz \$4, 1/2 doz \$5
Fraser's, 1888.	1/2 gr \$9.50
Dixon's Everlasting, in bxs.	1/2 doz 1 1/2; 2 1/2 \$2.00
Dixon's Everlasting, 10-b pails, ea. 85¢	
Lower grades, special brands.	1/2 gr \$5.50 @ \$7.00

Axles.

No. 1, 4¢ @ 4¢, No. 2 5¢ @ 5¢	
Nos. 7 to 14.	55¢ & 5%
Nos. 15 to 18.	47 1/2¢
Nos. 19 to 22.	70%
National Tubular Self-Oiling: Standard	
Farm (1 to 5) and Special Farm (A1 to A5).	
Less than 10 sets.	33 1/2¢
Over 10 sets.	33 1/2¢ & 5%

Bag Holders.

Sprengle's Pat.	1/2 doz \$18.
Spring Balances.	50%
Common 24-lb.	1/2 doz \$1.50.
Chatillon's Spring Balances.	50%
Chatillon's Circular Spring Balances.	60%

Bells.

Hand-B.

Light Brass.	70¢ & 10¢ @ 75%
Extra Heavy.	60¢ & 10%
White Metal.	60¢ & 10¢ & 10%
Silver Chime.	33 1/2¢ & 10%
Globe (Cone's Patent).	25¢ & 10¢ & 35%

Door.

Gong, Abbe's.	33 1/2¢ & 10%
Gong, Yankee.	45¢ & 10%
Gong, Barton's.	40¢ & 10¢ & 50%
Crank, Taylor's.	25¢ & 10%
Crank Brooks.	50¢ & 10¢ & 25%
Crank Cone's.	10%

Crank, Connel's.	20¢ & 10%
Lever, Sargent's.	60¢ & 10%
Lever, Taylor's Bronzed or Plated.	net
Lever, Taylor's Japanned.	25¢ & 10%
Lever, R. E. M. Co's.	50¢ & 10¢ & 25%
Pull, Brook's.	50¢ & 10¢ & 25%
Pull, Western.	25¢ & 10%

Cone.

Common Wrought.	60¢ & 10%
Western, Sargent's list.	20¢ & 10%
Western, Sargent's list.	70¢ & 10%
Kentucky, "Star".	20¢ & 10%
Kentucky, Sargent's list.	70¢ & 10%
Dodge, Genuine Kentucky.	70¢ & 10%
Texas Star.	50¢ & 10¢ & 30¢ & 10¢ & 5%
Call.	40¢ & 40¢ & 5%
Farm Bells.	1/2 doz \$3.45
Steel Alloy Church and School Bells.	40%

Bellows.

Blacksmith's.	60¢ & 40¢ & 5%
Molders.	40¢ & 40¢ & 10%
Hand Bellows.	40¢ & 10¢ & 50%

Belted, Rubber.

Common Standard.	70¢ & 10%
Standard.	70¢ & 10%
Extra.	40¢ & 60¢ & 10%
N. Y. B. & P. Co., Carbon.	60¢ & 10¢ & 5%
N. Y. B. & P. Co., Diamond.	50¢ & 10%

Bench Stops.

Morrill's.	1/2 doz \$9, 50%
Hotchkiss's.	1/2 doz \$5, 10¢ & 10%
Weston's, No. 1, \$10; No. 2, \$9.	25¢ & 10¢ & 5%
McGill's.	1/2 doz \$3.
Cincinnati.	25¢ & 10%

Bits.

Auger, Gimlet, Bit Stock, Drills, &c.	
See Augers and Bits.	

Bit Holders.

Extension.	
Barber's, 1/2 doz \$15.00.	40¢ & 40¢ & 10%
Ives, 1/2 doz \$20.00.	60¢ & 5¢ & 60¢ & 10%
Diagonal.	1/2 doz \$24.00, 40%
Angular.	1/2 doz \$24.00, 40¢ & 5%

Blind Adjusters.

Domestic.	1/2 doz \$3.00, 33 1/2¢
Excelsior.	1/2 doz \$1.00.
Washington's Self-Locking.	20¢ & 20¢ & 10%

Blind Fasteners.

Mackrell's, 1/2 doz, \$1.00.	20¢ & 20¢ & 10%
Van Sand's Screw Pat., \$15 1/2 gr.	60¢ & 10%
Van Sand's Old Pat., \$15.00 1/2 gr.	55¢ & 10%
Wasserman's Old Pattern, 1/2 gr.	60¢ & 10%
Merriman's.	new list
Austin & Eddy No. 2008, 1/2 gr.	20.00
Security Gravity, 1/2 gr.	19.00

Blind Staples.

Barbed, 1/2 in. and larger.	1/2 doz 7 1/2¢ @ 8¢
Barbed, 3/4 in.	1/2 doz 8 1/2¢ @ 9¢

Blocks.

Ordinary Tackle, list May 20, 1889.	50%
Cleveland Block Co., Mal. Iron.	50%
Moore's Novelty, Mal. Iron.	50%

Bolts.

Door and Shutter.

Cast Iron Barrel, Square, &c. 70¢ & 70¢ & 10%	
Cast Iron Shutter Bolts.	70¢ & 70¢ & 10%
Cast Iron Chain Sargent's list.	65¢ & 10%
Ives' Patent Door Bolts.	60%
Wrought Barrel.	70¢ & 70¢ & 10%
Wrought Square.	70¢ & 70¢ & 10%
Wrt Shutter, all iron, Stanley's.	60¢ & 10%
Wrt Shutter, Brass Knob.	40¢ & 10%
Wrt Shutter, Sargent's list.	60¢ & 10%
Wrt Sunk Flush, Sargent's list.	55¢ & 10%
Wrt Sunk Flush, Stanley's list.	50¢ & 10%
Wrt B.K. Flush, Com'n	55¢ & 10%

Carriage, Machine, &c.

Com. list June 10, '84.	70¢ & 10¢ & 10¢ & 25%
Genuine Eagle, list Oct. '84.	75¢ & 10¢ & 80%
Phila. pattern, list Oct. 7, '84.	80¢ & 80¢ & 10%
R.B. & W., old list.	70%
Machine, according to size.	75¢ & 10¢ & 80%
Bolt Ends, according to size.	75¢ & 10¢ & 80%

Tire.

Common, list Feb. 28, '83.	67 1/2¢
Port Chester Bolt and Nut Company.	
Empire, list Feb. 28, '83.	67 1/2¢
Keystone, Philadel., list Oct. '84.	80%
Norway, Phila., list Oct. '84.	75%
American Screw Company.	
Norway, Phila., list Oct. 16, '84.	75%
Eagle, Phila., list Oct. 16, '84.	80%

Cards—

Horse & Curry.....10&10&10&10&10
Cotton.....10&10&10&10&10
Wool.....10&10&10&10&10

Carpet Stretchers—

Cast Steel, Polished.....doz \$22.25
Cast Iron, Steel Points.....doz \$20.00
Rocket.....doz \$17.50
Bullard.....25&25&25&25&25

Carpet Sweepers—

Rissell No. 5.....doz \$17.00
Rissell No. 7 New Drop Pan.....doz \$19.00
Rissell, Grand.....doz \$30.00
Grand Rapids.....doz \$24.00
Crown Jewel, No. 2.....\$19.00; No. 3, \$20.00

Mastic.....doz \$15.00
Jewel.....doz \$17.00
Improved Parlor Queen.....doz \$17.00

Nickel.....doz \$27.00
Japanned.....doz \$24.00
Excelior.....doz \$22.00
Garland.....doz \$18.00

Parlor Queen.....doz \$24.00
Housewife's Delight.....doz \$15.00
Queen.....doz \$16.00

King.....doz \$18.00
Weed, Improved.....doz \$18.00
Hub.....doz \$16.00
Cog Wheel.....doz \$16.00

Conqueror.....doz \$22.00
Easy.....doz \$22.00
Monarch.....doz \$22.00
Goshen.....doz \$21.00

Advance.....doz \$18.00
Ladies' Friend, No. 1.....doz \$15.00
No. 2.....doz \$16.00
American.....doz \$15.00

Grand Republic.....doz \$35.00
Cartridges—
See Ammunition.

Casters—

Red.....Brass.....55&55&119
Plate.....Others.....60&60&105
Shallow Socket.....40&105

Deep Socket.....40&105
Yale Casters, list May, 1884.....30&10&405
Yale Gem.....60&60&55
Martin's Patent (Phoenix).....45&10&505

Payson's Anti-friction.....60&60&105
Giant Truck Casters.....305
Stationary Truck Casters.....50&105
Socket Truck Casters.....505

Cattle Leaders—

Humason, Beckley & Co.'s.....705
Sargent's.....605&105
Hotchkiss.....305
Peck, Stow & W. Co.....50&105

Chain—

Trace, 6-10-2, exact.....50&10&50&10&5
Trace, 6-10-3, exact.....50&10&50&10&5
Trace, 7-10-2, exact.....50&10&50&10&5
Trace, 7-10-3, exact.....50&10&50&10&5

Note.—Traces, "Regular" sizes, 3¢ net
pair less than exact.
Log, Fifth, Stretcher, and other fancy
Chains, list Nov. 1, 1884.....50&10&50&10&5

American Coll. in case lots,
3-16 1/4 5-16 3/4 7-16 1/2 4 5 6 8 1/2
\$8.00 5.70 4.80 4.20 3.90 3.75 3.65 3.55
Less than case lots, add 1/2¢ per lb.
German Coll. list of June 20, 1887.....50&10&50&10&5

German Halter Chain, list of June 20,
1887.....60&25
Covert Halter.....60&25
Covert Traces.....35&25

Onelda Halter Chain.....60&60&55
Galvanized Pump Chain.....75&55&45
Jack Chain, Iron.....75&70&55
Jack Chain, Brass.....70&70&55

Chalk—

White.....per gr 50¢
Red.....per gr 70¢
Blue.....per gr 85¢
See also Crayons.

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.....\$4.75&5.00
New Haven......75&75&105
Wetherby......75&75&105
Mix......75&75&105

Ohio Tool Co......75&75&55
Douglass......75&75&55
Buck Bros......305
Merrill......60&10&60&10&55
L. & J. J. White......30&30&55

Tanged and Miscellaneous.
Tanged Firmer.....40&10&505
Butcher's.....\$4.75&5.00
Spear & Jackson's.....\$5.00
Buck Bros......305
Cold Chisels, per doz.....16&19¢

Chucks—

Beach Pat.....each, \$8.00.....205
Morse's Adjustable, each, \$7.00, 20&20&55
Danbury.....each, \$6.00, 30&30&55
Syracuse, Balz Pat.....255
Skinner's Pat. Drill Chucks.....305
Skinner's Independent Lathe Chucks.....405
Skinner's Pat. Comb. Chuck.....405

Union Mfg. Co.,
Victor.....88.50, 255
Combination.....405
Universal.....405
Independent.....455

Clamps—
R. I. Tool Co.'s Wrought Iron.....255
Adjustable, Cincinnati.....15&105
Adjustable, Hammonds.....155
Adjustable, Stearn's.....30&105
Stearns' Adjustable Cabinet and Cor-
ner.....30&105
Cabinet, Sargent's.....60&60&105
Carriage Makers', Sargent's.....70&105
Eberhard Mfg. Co.....40&50&10&105
Warner's.....40&10&60&10&55
Saw Clamps, see Vises.
Carpenters', Cincinnati.....1.55

Clips—

Norway, Axle, 1/2 & 5-16.....55&55&55
2nd grade Norway Axle, 1/2 & 5-16.....65&55&55
Superior Axle Clips.....605&55&704
Norway Spring Bar Clips, 5-16.....60&55&55
Wrought Iron Felloe Clips.....per lb, 5¢
Steel Felloe Clips.....per lb, 5¢
Hacker Axle Clips.....255

Cockeyes—

.....505
Cocks, Brass.
Hardware list.....50&25

Coffee Mills—

Rox and Slide, list Jan. 1, 1888.....60&25
American Enterprise Mfg Co.....20&10&305
The Swift, Lane Bros.....20&105

Compasses Dividers, &c—

Compasses, Callipers, Dividers, 70&70&105
Bemis & Call Co.'s
Dividers.....60&55
Compasses & Callipers.....50&55

Wing and Inside or Outside.....50&55
Double.....505
Call's Pat. Inside.....505
Excelior.....605
J. Stevens & Co.'s.....25&105

Starrett's
Spring Callipers and Dividers 25&10&105
Lock Callipers and Dividers.....25&105
Combination Dividers.....25&105

Coopers' Tools—

Bradley's.....205
Bradley's.....20&10&55
L. & J. J. White.....30&55
Albertson Mfg. Co.....255
Beatty's.....305
Sandusky Tool Co.....30&30&55
Shaves, Cincinnati Tool Co.....205

Corkscrews—

Humason & Beckley Mfg. Co., 40&40&105
Clough's Pat.....335&335&55
Howe Bros & Hulbert.....355

Cork Knives and Cutters—

Bradley's.....105
Wadsworth's.....255

Cradles—

Grain.....50&55&2 @ 50&10&25

Crayons.

White Crayons, per gr 12&12&55.....105
D. M. Stewart Mfg. Co., Metal Work
ers, per gr, \$2.50.....255
D. M. Stewart Mfg. Co., Rolling Mill,
per gr, \$2.50.....255
See also Chalk.

Crow Bars—

Cast Steel.....per lb 4 1/2¢
Iron, Steel Points.....per lb 3 1/2¢

Curry Combs—

Fitch's.....50&10&50&10&105
Rubber per doz \$10.00.....205
Perfect.....505

Curtain Pins—

Silvered Glass.....net
White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....355
Wostenholme.....\$7.75 to \$2

Dampers, &c—

Dampers, Buffalo.....40&105
Buffalo Damper Clips.....40&105
Crown Damper.....405
Excelior.....40&105

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list
30&105
Leather, Pope & Steven's list.....405
Brass, Pope & Steven's list.....405

Door Springs—

Torrey's Rod, regular size.....per doz \$1.30
Gray's, per gr, \$20.00.....205
Bee Rod, per gr, \$20.00.....205
Warner's No. 1, per doz, \$2.50; No. 2,
\$3.30.....40&10&505
Gem (Coll), list April 19, 1886.....105
Star (Coll), list April 19, 1886.....205
Victor (Coll).....60&60&105
Champion (Coll).....60&10&60&10&105
Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....
Cowell's.....No. 1, per doz, \$18.00; No. 2,
\$15.00.....505
Rubber, complete, per doz, \$4.50.....55&105
Hercules.....505
Shaw Door Check and Spring, 25&30&355

Drawing Knives—

Wetherby......75&75&105
Merrill......75&75&105
New Haven......75&75&105
Douglass......75&75&55
Watrous......15&10&255
L. & J. J. White.....20&55
Bradley's.....355
Adjustable Handle.....25&30&355
Wilkinson's Folding.....25&25&55

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75
Blacksmiths' Self-Feeding, each \$7.50, 205
Breast, P. S. & W.....40&105
Breast, Wilson's.....30&55
Breast, Millers Falls.....each \$3.00, 255
Breast, Bartholomew's.....each \$2.50,
25&10&405

Ratchet, Merrill's.....255
Ratchet, Ingersoll's.....255
Ratchet, Parker's.....20&20&55
Ratchet, Whitney's.....20&105
Ratchet, Weston's.....20&255
Ratchet, Moore's Triple Action.....25&305
Ratchet, Curtis & Curtis.....305
Whitney's Hand Drill, Plain, 110 lb.....
Adjustable, \$12.00.....30&105
Wilson's Drill Stocks.....105
Automatic Boring Tools.....\$1.75&\$1.85

Twist Drills—

Morse......50&10&55
Standard......50&10&55
Syracuse (Metal) list.....50&105
Cleveland......50&10&55
Williams......50&10&55
New Process......50&10&55

Drill Bits—See Augers and Bits

Drill Chucks—See Chucks.**Dripping Pans—**

Small sizes.....per lb 6 1/2¢
Large sizes.....per lb 5 1/2¢

Egg Beaters.

Dover.....per doz \$1.50
National, per doz \$4.50.....355
Family (T. & S. Mfg. Co.), per gro \$17.006
\$18.00

Duplex (Standard Co.).....per doz \$1.25
Rival (Standard Co.).....per doz \$1.00
Duplex Extra Heavy (Standard Co.).....
per doz \$3.50

Triumph (T. & S. Mfg. Co.), per gro \$10.50
Advance, No. 1.....per gro \$10.50
Bohren's Pat. Rubber Ball.....per gro \$10.00
Bryant.....per gro \$14.00

Ayres' Spiral.....per gro \$5.00
Double (H. & R. Mfg. Co.).....per gro \$10.20
Triple (H. & R. Mfg. Co.).....per gro \$10.20
Spiral (H. & R. Mfg. Co.).....per gro \$4.50
Paine, Diehl & Co.'s.....per gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, per doz, No.
1, \$6.00; No. 2, \$9.00.....255

Electric Bell Sets—

Wollensak's.....205
Bigelow & Dowse.....205

Emery— No. 4 to No. 54 to Flour, CF
46 gr, 150 gr, F F F.
Kegs, per lb.....4 1/2¢ 5¢ 2 1/2¢
5 kegs, per lb.....5¢ 5 1/2¢ 3¢
10-lb cans, 10
in case.....6¢ 6 1/2¢ 5¢
10-lb cans, less
than 10.....10¢ 10¢ 7 1/2¢

Enameled and Tinned Ware—
See Hollow Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1885.....50&10&50&10&55
Brass.....60&60&55

Escutcheons.

Door Lock.....Same dis as Door Locks.
Brass Thread.....60&60&105
Wood.....255

Faucets—

Fenn's.....405
Fenn's Cork Stops.....255
Star.....355
Frary's Pat. Petroleum.....40&5&25
B. & L. B. Co.

West's Lock, Open and Shut Key.....505
Star, Metal Plug, new list.....405
Lockport, Metal Plug, reduced list.....405
Metallic Key, Leather Lined.....60&105

Cork Lined.....70&5&70&105
Burnside's Red Cedar.....505
Burnside's Red Cedar, bbl lots.....50&105
John Sommer

Peerless Best Block Tin Key.....405
Perfection, Cork Lined.....505
Diamond Lock.....405
Perfection, Fla. Red Cedar.....505
Goodenough Cedar.....505
Boss Metallic Key.....505
Reliable Cork Lined.....505
Western Pattern Cork Lined.....505

Self-Measuring
Enterprise, per doz \$50.00.....20&105
Lane's, per doz \$36.00.....25&105
Victor, per doz \$36.00.....25&105

Felloe Plates—

per lb 6¢

Fifth Wheels—

Derby and Cincinnati.....50&55
Brewster.....55&55

Files—

Domestic—
Nicholson Files, Rasps, &c.....60&10&60&10&55
Nicholson (X. F.) Files.....255
Nicholson's Royal Files (Seconds).....755
(extra prices on certain sizes)
Other makers, best brands.....60&10&705
Fair brands.....60&10&705
Second quality Key.....70&10&75&105
Nicholson's Horse Rasps.....60&10&605

Heller's Horse Rasps.....50&75&60&105
McCaffrey's Horse Rasps.....50&105
Boss Metallic Key, Hand Cut.....50&105

Imported—
Moss & Gamble.....list, April 1, 1885, 155
Butcher.....Butcher's list, 205
Turton's.....Turton's list, 205
Greaves' Horse Rasps.....American list, 605

Fluting Machines—

Knox, 4 1/2-inch Rolls.....\$3.25 each } 355
Knox, 6-inch Rolls.....\$3.60 each } 355
Eagle, 3 1/2-inch Roll, \$2.15.....355
Eagle, 5 1/2-inch Roll, \$2.85.....355
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
\$6.50 each.....355
Crown Jewel, 6 in.....\$3.50 each, 355
American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
\$4.50 each.....355
Domestic Fluter.....each, \$1.50
Geneva Hand Fluter, White Metal.....
per doz \$12, 255

Crown Hand Fluter, No. 1, \$15.00; 2,
\$12.50; 3, \$10.00.....305
Shepard Hand Fluter, No. 85 per doz
\$15.30.....405
Shepard Hand Fluter, No. 110 per doz
\$15.30.....405
Shepard Hand Fluter, No. 95 per doz
\$8.00.....405
Clark's Hand Fluter, per doz \$15.00.....355
Combined Fluter and Sad Iron,
per doz \$15.00.....305
Buffalo.....per doz \$10.00.....105

Fluting Scissors—

Blair's.....per doz \$2.00
Blair's "Climax".....per doz \$1.25

Fodder Squeezers—

Blair's.....per doz \$2.00
Blair's "Climax".....per doz \$1.25

Forks—

Hay, Manure, &c., Ass'd list.....704
Hay, Manure, &c., Phila. list 60&60&55
Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....65&65&55
Shepard's Lightning.....65&65&55
White Mountain.....50&20&55
New Arctic.....50&40&55
American.....605
Gem.....655
Blizzard.....705
Double Action Crown.....605
Crown.....605
Star.....605
Peerless and Giant.....60&10
Zero and Pet.....65&105
Boss.....65&10&105
Keystone, each, \$1.50.....255

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10&304
Henis.....per doz \$2.50
Shepard's Queen City.....405

Fry Pans—

Standard List:
No.....0 1 2 3 4
per doz.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No.....5 6 7 8
per doz.....\$6.00 \$7.00 \$8.00 \$9.00

Polished, regular goods.....70&10&755
Acme Fry Pans.....60&105

Fuse—

Common Hemp Fuse, for dry ground, \$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.10
Triple Taped Fuse, for very wet gr. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gauges—

Marking, Mortise, &c.....60&105
Starrett's Surface, Center and Scratch,
25&105
Wire, low list.....10&105
Wire, Wheeler, Madden & Co.....105
Wire, Morse's.....50&50&55
Wire, Brown & Sharpe's.....10&205

Gimlets—

Nail and Spike.....50&10&55
"Eureka" Gimlets.....40&105
"Diamond" Gimlets.....per gr \$5.00
Double Cut, Shepardsen's.....40&45&55
Double Cut, Ives.....60&60&55
Double Cut, Douglass.....40&105
"Bee," per gr \$12.....25&25&55

Glue—

Le Page's Liquid.....25&25&55
Upton's Liquid.....355
Le Page & Co.'s Improved Process
25&25&55

Glue Pots—

Tinned.....40&55
Enameled.....40&55
Family, Howe's "Eureka".....405
Family, L. F. C.'s "Handy".....505

Grindstones—

Small, at factory.....per ton \$7.50&9.00

Grindstone Fixtures—

Sargent's Patent.....70&105
Reading Hardware Co.....30&105

Hack Saws—

See Saws.

Halters—

Covert's, Rope, 1/2-in. Jute.....50&25
Covert's, Rope, 1/2-in. Hemp.....50&25
Covert's Adj. Rope Halters.....40&25
Covert's Hemp Horse and Cattle Tie,
50&25
Covert's Jute Horse and Cattle Ties,
60&10&25

Hammers—

Handled Hammers—
Maydole's, list Dec. 1, '85.....25&105&355
Buffalo Hammer Co.'s (list Jan. 15, '87)
Humason & Beckley.....50&60&105
Ahn Tool Co.....40&10&505
Fayette R. Plumb.....40&10&505
C. Hammond & Son, list, Oct., 1889, 505
Verree.....55
Magnetite Tack, Nos. 1, 2, 3, \$1.25, 1.50 &
1.75.....30&105
Nelson Tool Works.....40&105
Warner & Nobles.....28&25
Peck, Stow & Wilcox.....405
Sargent's.....33 1/2&105

Heavy Hammer and Sledge—
3 lb and under.....per lb 40¢
3 to 5 lb.....per

Cross-Cut Saw Handles—	
Atkins' No. 1 Loop, pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.	
Boynnton's Loop Saw Handles, 50¢... 60¢	
Champion..... 15¢	
Hangers—	
Barn Door, old patterns, 60¢10¢10¢70¢	
Barn Door, New England, 60¢10¢10¢70¢	
Samson Steel Anti-Friction..... 55¢	
Orleans Steel..... 55¢	
Hamilton Wrought Wood Track..... 55¢	
U. S. Wood Track..... 55¢	
Champion..... 60¢10¢	
Rider and Wooster, Medina Mfg. Co.'s list..... 70¢	
Climax Anti-Friction..... 60¢	
Climax Anti-Friction for Wood Track..... 55¢	
Zenith for Wood Track..... 55¢	
ed's Steel Arm..... 50¢	
challenge, Barn Door..... 50¢	
Sterling's Imp'ed (Anti-Friction) 65¢10¢	
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00..... 50¢25¢	
Cherliffe..... 50¢10¢	
Kidder's..... 50¢10¢	
The Boss..... 60¢10¢	
Best Anti-Friction..... 60¢10¢	
Duplex (Wood Track)..... 60¢10¢5¢	
Terry's Pat., # doz pr. 4 in, \$10.00; 5 in, \$12.00..... 50¢10¢	
Terry's Steel Anti-Friction Leader 30¢10¢	
Terry's Steel Anti-Friction Ideal, 50¢10¢	
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00..... 50¢15¢60¢	
Wood Track Iron Clad, # ft. 10¢..... 50¢	
Carrier Steel Anti-Friction..... 50¢50¢5¢	
Architect, # set \$6.00..... 20¢	
Eclipse..... 20¢10¢	
Felix, # set \$4.50..... 20¢	
Richards..... 30¢30¢10¢	
Lane's Steel Anti-Friction..... 50¢	
Ball Bearing Door Hanger..... 20¢10¢10¢	
Warner's Pat..... 20¢20¢10¢	
Stearns' Anti-Friction..... 20¢20¢10¢	
Stearns' Challenge..... 25¢10¢25¢10¢10¢	
Faultless..... 40¢40¢5¢	
American, # set \$6.00..... 20¢10¢	
Ridger & Wooster, No. 1, 62¢; No. 2, 75¢..... 40¢	
Paragon, Nos. 1, 2 and 3..... 40¢10¢	
Cincinnati..... 25¢10¢	
Paragon, Nos. 5, 6, 7 and 8..... 20¢10¢	
Crecent..... 60¢60¢10¢	
Nickel, Cast Iron..... 50¢	
Nickel, Malleable Iron and Steel..... 40¢	
Scranton Anti-Friction Single Strap..... 33¢	
Scranton Anti-Friction Double Strap..... 40¢	
Universal Anti-Friction..... 40¢	
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00..... 45¢	
Star..... 40¢	
May..... 50¢50¢50¢10¢	
Barry, \$6.00..... 40¢10¢	
Harness Snaps—	
See Snaps.	
Hatchets—	
List Jan. 1, 1886.	
Isaiah Blood..... 35¢40¢	
Hunt's Shingling, Lath and Claw..... 40¢5¢	
Hunt's Broad..... 40¢	
Buffalo Hammer Co..... 40¢10¢50¢	
Hurd's..... 40¢10¢50¢	
Fayette R. Plumb..... 40¢10¢50¢	
Wm. Mann, Jr., & Co..... 40¢50¢5¢	
Underhill Edge Tool Co..... 40¢50¢40¢10¢	
Underhill's, Haines and Bright..... 33¢	
C. Hammond & Son..... 40¢10¢50¢	
Peck's..... 40¢10¢40¢10¢5¢	
Kelly's..... 50¢50¢5¢	
Sargent & Co..... 50¢	
Ten Eyck Edge Tool Co. 40¢10¢40¢10¢5¢	
Collins..... 10¢	
Schulte, Loboff & Co..... 50¢50¢5¢	
Hay and Straw Knives—	
Lightning Mfrs. price # doz \$18.00, 25¢ But jobbers cut this price freely.	
Gem..... # doz \$10	
Wadsworth's..... 40¢7¢40¢10¢	
Carter's Needle..... # doz \$11.50¢12.00	
Heath's..... # doz \$13.50¢14.00	
Auburn Hay, Com. and Spear Point..... 50¢	
Auburn, Straw..... 40¢	
Nolin's Hay..... # doz \$10.00	
Hinges—	
Wrought Iron Hinges	
Strap and T..... 70¢10¢75¢	
Screw Hook and..... 6 to 12 in., # B. 4-2-10¢	
Strap..... 14 to 20 in., # B. 3-7-10¢	
Strap..... 22 to 36 in., # B. 3-7-10¢	
Heavy Welded..... 6 to 12 in., # B. 4-2-10¢	
Hook..... 14 to 20 in., # B. 3-7-10¢	
Hook..... 22 to 36 in., # B. 3-7-10¢	
Screw Hook..... 2 1/2 in., # doz \$1.50	
and Eye..... 2 1/2 in., # doz \$2.45, 10¢	
and Eye..... 2 1/2 in., # doz \$3.80	
Rolled Blind Hinges, Nos. 32 and 34..... 50¢10¢	
Rolled Blind Hinges, Nos. 232 and 234..... 50¢10¢	
Rolled Plate..... 70¢10¢	
Plate Hinges (8, 10 & 12 in., # B. 5-4-10¢	
"Providence" over 12 in., # B. 5-4-10¢	
Spring Hinges—	
Geer's Spring and Blank Butts..... 40¢	
Union Spring Hinge Co.'s list, March 1886..... 20¢	
Ame..... 30¢	
U. S..... 25¢10¢	
Empire and Crown..... 20¢	
Hero and Monarch..... 55¢	
American, Gem, and Star..... 25¢	
Oxford..... 20¢	
Barker's Double Acting..... 20¢10¢	
Union Mfg. Co..... 25¢	
Bommer's..... 30¢	
Buckman's..... 15¢20¢	
Chicago..... 30¢	
Wiles'..... 10¢	
Devore's..... 40¢	
Rex..... 40¢	
Royal..... 60¢	
Reliable..... 60¢	
Champion..... 60¢	
Gate Hinges—	
Wetern..... # doz \$4.40, 60¢	
N. E..... # doz \$7.00, 55¢	
N. E. Reversible..... # doz \$5.20, 55¢10¢	
Clark's, Nos. 1, 2, 3..... 60¢10¢5¢	
N. Y. State..... # doz \$5.00, 55¢10¢	
Automatic..... # doz \$1.50, 50¢	
Common Sense..... # doz \$4.50, 50¢	
Seymour's..... 45¢10¢	
Shepard's..... 60¢10¢5¢	
Reed's Latch and Hinges..... # doz \$12.00, 50¢	
Blind Hinges—	
Parker..... 75¢2¢	
Paumer..... 50¢50¢10¢	
Seymour..... 70¢2¢	
Nicholson..... 45¢10¢	
Wagner..... 50¢	

Clark's, Nos. 1, 3, 5, 10 and 50..... 75¢10¢50¢80¢	
Clark's Mortise Gravity..... 50¢	
Sargent's, Nos. 1, 3, 5, 11, 13..... 75¢10¢55¢10¢5¢	
Sargent's, No. 12..... 75¢10¢55¢10¢5¢	
Reading's Gravity..... 75¢10¢75¢10¢5¢	
Shepard's..... 75¢10¢10¢12¢5¢	
Niagara..... 80¢21¢5¢	
Buffalo..... 80¢5¢	
Clark's Genuine Pat..... 80¢5¢	
O. S. Lull & Porter..... 75¢10¢80¢	
Acme, Lull & Porter..... 75¢5¢	
Queen City Reversible..... 75¢	
Clark's Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3..... 75¢10¢21¢5¢	
Lane's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50..... 25¢25¢	
Hoes—	
Handled—	
Garden, Mortar, &c..... 70¢	
Planter's, Cotton, &c..... 70¢	
Warren Hoe..... 60¢	
Magie..... # doz \$4.00	
Eye—	
D. & H. Scovill..... 20¢	
Lane's Crescent Planter Pattern..... 45¢5¢	
Lane's Razor Blade, Scovill Pattern..... 30¢	
Maynard, S. & O. Pat..... 45¢5¢	
Sandusky Tool Co., S. & O. Pat..... 60¢5¢	
Hubbard & Co., S. & O. Pat. 60¢5¢10¢	
Chattanooga Tool Co., S. & O. Pat. 60¢	
Grub..... 60¢60¢10¢	
Hog Rings and Ringers—	
Hill's Improved Ringers..... # doz \$4.25	
Hill's Old Style Ringers..... # doz \$2.75	
Hill's Tongues..... # doz \$4.50	
Hill's Rings..... # doz \$2.50	
Perfect Rings..... # doz bxs \$1.00¢1.70	
Perfect Ringers..... # doz \$2.15¢2.25	
Blair's Hog Ringers..... # doz \$2.25¢2.50	
Blair's Hog Rings..... # doz 90¢¢1.00	
Champion Ringers..... # doz \$2.00	
Champion Rings, Double..... # doz \$2.25	
Brown's Ringers..... # doz \$2.00	
Brown's Rings..... # doz \$1.25¢1.30	
Hoisting Apparatus—	
Moore's Hand Hoist, with Lock	
Brake..... 20¢	
Moore's Differential Pulley Block..... 40¢	
Energy Mfg. Co.'s..... 25¢	
Holders, File and Tool—	
Balz Pat..... # doz \$4.00, 25¢	
Nicholson File Holders..... 20¢	
Hollow-Ware—	
Iron—	
Stove Hollow-Ware—	
Ground..... 60¢60¢5¢	
Unground..... 60¢10¢60¢10¢10¢	
Boilers and Saucepans..... 40¢5¢	
Tinned Boilers and Saucepans..... 40¢	
Gray Enamelled-Ware—	
Stove..... 45¢50¢	
Maslin Kettles..... 60¢10¢60¢10¢10¢	
Boilers and Saucepans..... 40¢5¢	
Agate and Granite Ware, list Jan. 1, 1889..... 33¢10¢	
Rustless Hollow-Ware..... 50¢50¢5¢	
Galvanized Tea-Kettles.....	
Inch..... 6 7 8 9	
Each..... 55¢ 60¢ 65¢ 75¢	
Silver Plated—	
4 mo. or 5¢ cash in 30 days.	
Reed & Barton..... 30¢	
Meriden Britannia..... 40¢5¢	
Stimpson, Hall, Miller & Co..... 40¢5¢	
Rogers & Brother..... 40¢5¢5¢	
Hartford Silver Plate Co..... 40¢5¢5¢	
William Rogers Mfg. Co..... 40¢5¢5¢	
Knobs—	
Cast Iron—	
Bird Cage, Sargent's list..... 60¢10¢10¢	
Bird Cage, Reading..... 60¢10¢10¢	
Clothes Line, Sargent's list..... 60¢10¢10¢	
Clothes Line, Reading list..... 60¢10¢10¢	
Colling, Sargent's list..... 55¢10¢10¢	
Harness, Reading list..... 55¢10¢10¢	
Coat and Hat, Sargent's list..... 55¢10¢10¢	
Coat and Hat, Reading..... 50¢10¢50¢10¢10¢	
Wrought Iron—	
Cotton..... # doz \$1.25	
Cotton Pat. (N.Y. Mallet & Handle Wks.)..... 30¢	
Tassel and Picture (T. & S. Mfg. Co.)..... 50¢	
Wrought Stapler, Hooks, &c..... 50¢	
Wire—	
Wire Coat and Hat, Gem, list April, 1886..... 50¢	
Wire Coat and Hat, Miles, list April, 1886..... 50¢	
Indestructible Coat and Hat..... 45¢	
Wire Coat and Hat, Standard..... 45¢	
Belt..... 80¢80¢10¢	
Miscellaneous.	
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50	
Brush, No. 1..... # doz \$2.25	
Whiffletree—Patent..... 55¢	
Hooks and Eyes—Malleable Iron..... 70¢70¢10¢	
Fish Hooks, American..... 60¢10¢10¢	
Bench Hooks..... See Bench Stops.	
Horse Nails—	
Nos. 6 7 8 9 10	
Ausable..... 28¢ 26¢ 25¢ 24¢ 23¢	
Clinton, Fin..... 10¢¢11¢, net	
Essex..... 28¢ 26¢ 25¢ 24¢ 23¢	
Lyra..... 25¢ 23¢ 22¢ 21¢ 20¢	
Snowden..... 25¢ 23¢ 22¢ 21¢ 20¢	
Putnam..... 25¢21¢ 20¢ 19¢ 18¢	
Vulcan..... 23¢ 21¢ 20¢ 19¢ 18¢, 12¢ in year 15¢	
Northwest'n..... 25¢ 23¢ 22¢ 21¢ 20¢	
Globe..... 23¢ 21¢ 20¢ 19¢ 18¢, 20¢21¢	
Boston..... 23¢ 21¢ 20¢ 19¢ 18¢, 20¢21¢	
A. C..... 25¢ 23¢ 22¢ 21¢ 20¢	
C. B.-K..... 25¢ 23¢ 22¢ 21¢ 20¢	
Champlain..... 28¢ 6¢ 25¢ 24¢ 23¢	

New Haven..... 28¢ 26¢ 25¢ 24¢ 23¢,
25&10¢25¢10&10¢
Saranac..... 23¢ 21¢ 20¢ 19¢ 18¢, 30&10¢
Champion..... 25¢ 23¢ 22¢ 21¢ 20¢,
10&10&10¢
Capewell..... 28¢ 26¢ 5¢ 24¢ 23¢,
35&5¢35&5¢10¢
Star..... 23¢ 21¢ 20¢ 19¢ 18¢,
10&10&10&12&5¢
Anchor..... 23¢ 21¢ 20¢ 19¢ 18¢, 35¢
Western..... 23¢ 21¢ 20¢ 19¢ 18¢, 40&10¢
Empire Bronze..... 14¢ 12¢,
10¢ 11¢ 10¢
Horse Shoes—See Shoes Horse.

Hose, Rubber—

Competition..... 75¢10¢75¢10&5¢
Standard..... 70¢70¢10¢
N. Y. B. & P. Co., Para..... 30¢10¢
N. Y. B. & P. Co., Extra..... 50¢
N. Y. B. & P. Co., Dundee..... 60¢10&5¢

Huskers—

Blair's Adjustable..... # gr \$8.00
Blair's Adjustable Clipper..... # gr 7.00
Hubbard's Solid Steel..... # gr 4.50

Indurated Fiber-Ware—25¢.

Spittoons, No. 2, # doz..... 20.00
Basins, Ringed, # doz, No. 1, \$4.80; No. 2, \$4.20; No. 3..... 33.00
Washbubs, Nested, Nos. 1, 2 and 3 (4 pieces), # nest..... 7.50
Keeles, Nested, Nos. 1, 2, 3 and 4 (4 pieces), # nest..... 33.70
Butter Bowls 15, 17 and 19-inch (3 pieces), # nest..... 32.25
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) # set..... 4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), # set..... 33.00
See also *Patels*.

Jack Screws—See Screws.

Kettles— Spun, Stamped.
Brass, 7 to 17 in., # 24¢ 21¢
Brass larger than 17 in., # 26¢ 23¢
Enamelled and Tea Kettles..... See Hollow-Ware.

Keys— See Hollow-Ware.
Lock Ass'n list Dec. 30, 1886..... 50&10&60&5¢
Eagle, Cabinet, &c..... 33&25¢
Hotchkiss' Brass Blanks..... 40¢
Hotchkiss, Copper and Tinned..... 40¢
Hotchkiss' Pad. and Cab..... 35¢
Ratchet Bed Keys..... # doz \$4.00, 15¢
Wollensack Tinned..... 50&10¢

Knife Sharpeners—

Parkin's.....
Appelwood Handles..... # doz \$6.00, 40¢
Rosewood or Cocobolo..... # doz \$9.00, 40¢

Knives—

Wilson's Butcher Knives..... 25&30¢
Ames' Butcher Knives..... 25¢
Foster Bros. Butcher, &c..... 33&25¢
Nichols' Butcher Knives..... 40&10¢
Ames' Shoe Knives..... 20&25¢
Ames' Bread Knives..... # doz \$1.50, 15&20¢
Moran's Shoe and Bread..... 20¢
Hay and Straw..... See Hay Knives.
Table and Pocket..... See Cutlery.
Corn, Auburn Mfg. Co. Western Pat..... 22.00
Corn, Auburn Mfg. Co. Crescent..... 33.50

Knobs—

Door Mineral..... 65&68¢
Door Por. Jap'd..... 75&78¢
Door Por. Nickel..... \$2.00&2.25
Door Por. Plated, Nickel..... \$2.00&2.25
Drawer, Porcelain..... 60&10¢60&10&10¢
Hemacite Door Knobs..... 40&10¢50¢
Yale & Towne Wood, list Dec., 1885..... 40¢
Furniture Plain..... 75¢ gro iron, 10¢
Furniture, Wood Screws..... 25&10¢
Base, Rubber Tip..... 70¢10¢5¢
Picture, Judd's..... 30&10¢10¢70¢
Picture, Sargent's..... 70¢10¢
Picture, Hemacite..... 55&5¢
Shutter, Porcelain..... 65&10¢
Carriage, Jap..... # gro 80¢, 90&10¢

Ladders—

Melting, Sargent's..... 55&10¢
Melting, Reading..... 35&10¢
Melting, Monroe's Pat..... # doz \$4.00, 40¢
Melting, P. S. & W..... 35&10¢40¢
Melting, Warner's..... 30¢

Lanterns—

Tubular—

Plain with Guards, # doz..... \$4.00&4.25
Lift Wire, with Guards..... \$4.50&4.75
Square Plain, with guards..... \$4.00&4.25
Sq. Lift Wire, with Guards..... \$4.25&4.50
Without Guards, 25¢ # doz less..... 25¢
Miscellaneous.
Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75..... 30&25¢

Lawn Mowers—

Standard List..... 50&10¢
Quaker City..... 60&10¢
Enterprise..... 60&10¢

Lemon Squeezers—

Porcelain Lined, No. 1..... # doz \$4.00, 25&30¢
Wood, No. 2..... # doz \$3.00, 35¢
Wood, Common..... # doz \$1.75&1.75¢
Dunlap's Improved..... # doz \$3.75, 20¢
Sammis..... No. 1, \$5.00; No. 2, \$3.12;
\$18 1/2 doz..... 25&10¢
Sammis' Saf..... # doz \$2.50
The Boss..... # doz \$2.50
Dean's..... Nos. 1, # doz \$6.50, 2, \$3.35, 3, \$1.80
Little Giant..... 30&50&5¢
King..... 40&5¢
Hotchkiss Straight Flash..... # doz \$12.00

Lines—

Cotton and Linen Fish, Draper's..... 50¢
Draper's Chalk..... 60¢
Draper's Mason's Lines, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.55; No. 4, \$2.50; No. 5, \$3.50..... 50¢
Common Chalk..... 50¢
Samson, Cotton..... No. 1, \$2; No. 4, \$2.50; No. 5, 10¢
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00..... 25¢
Mason's Lines, No. 3, \$1.50; No. 4, \$2.00; No. 5, \$2.50..... 15¢
Wire Clothes, Nos. 18 1/2 19 30..... 66 0 30 50 50

Molasses Gates—

Stebbin's Pattern	75¢@75¢10¢
Stebbin's Genuine	60¢10¢10¢
Stebbin's Tinned Ends	40¢10¢
Chase's Hard Metal	50¢10¢
Rush's	20¢
Lincoln's Pattern	70¢@70¢10¢
Weed's	20¢10¢

Muzzles—

Safety	doz, \$3.00, 25¢
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Nails. See Trade Report.

Wire Nails, Papered	
Association list, July 15, 1889	70¢5¢
Tack Mfrs.' list	60¢10¢10¢
Wire Nails, Standard Penny	
Card June 1, '89, base	\$3.00 @ \$3.10

Nail Puller—

Curtiss Hammer	doz \$9.00
Giant, No. 1	doz, \$18.00, 10¢
Giant, No. 2	doz, \$15.00, 10¢
Pelican	doz, \$9.00, 25¢

Nail Sets—

Square	doz, \$4.00@4.25
Round	doz, \$3.25
Cannon's Diamond Point	doz, \$12, 20¢

Nut Crackers—

Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern	doz \$2.00, 10¢
Turner & Seymour Mfg. Co.	50¢

Nuts—

Nuts, off list Jan. 1, 1888: Square, Hex.	
Hot Pressed, 5-11	5-11
Cold Punched, 5-11	5-11
In lots less than 100 lb, do, add 1¢; 1-lb boxes, add 1¢ to list.	

Oakum—

Government	doz 7½¢@7½¢
U. S. Navy	doz 6½¢@6½¢
Navy	doz 5½¢@5½¢

Oilers—

Zinc and Tin	doz, \$5.00@5.00
Brass and Copper	doz, \$5.00@5.00
Malleable, Hammer, Improved, No. 1	\$3.60; No. 2, \$4.00; No. 3, \$4.40 doz.
Malleable, Hammers, Old Pattern, same list	40¢

Prior's Pat. or "Paragon" Brass—

Prior's Pat. or "Paragon" Brass	60¢10¢10¢
Olmstead's Tin and Zinc	60¢
Olmstead's Brass and Copper	60¢
Broughton's Zinc	60¢
Broughton's Brass	60¢
Gem P. D. & Co.	doz, \$2

Packing, Steam—

Standard	60¢10¢@60¢10¢10¢
Extra	50¢10¢@50¢10¢
N. Y. B. & P. Co. Standard	50¢10¢5¢
N. Y. B. & P. Co. Empire	70¢
N. Y. B. & P. Co. Salamander	
Jenkins' Standard	doz 65¢, 30¢

Miscellaneous—

American Packing	10¢@11¢ doz
Russia Packing	14¢ doz
Italian Packing	13¢@14¢ doz
Cotton Packing	15¢@17¢ doz
Jute	7¢@8¢ doz

Padlocks—**See Locks.****Pails—**

Galvanized Iron—See Trade Report	
Quarts	10 12 14
Hill's Light Weight, per doz.	\$2.75 3.00 3.25
Hill's Heavy Weight, per doz.	3.00 3.25 3.75
Whiting's, per doz.	2.75 3.00 3.25
Sidney Shepard & Co.	2.94 3.15 3.57
Iron Clad	2.50 2.75 3.00
Fire Buckets	2.75 3.25 3.50
Buckets, see Well Buckets.	

Indurated Fibre Ware—25¢	
Star Pails, 12 qt.	doz \$6.00
Fire, Stable and Milk, 14 qt.	doz \$7.80

Standard Fibre Ware—	
Plain, Dec'd	
Water Pails, 12 qt., per doz.	\$4.00 \$4.50
Dairy Pails, 14 qt., per doz.	4.50 5.00
Fire Pails, No. 1, 12 qt., per doz.	4.50
Fire Pails, No. 2, 14 qt., per doz.	5.00
Sugar Pails	6.00 6.50
Horse Pails	5.00
Rugby Pails	4.00
Slop Jars (bal. trap)	8.00 9.00
Chamber Pails, 14-qt.	6.50 7.50

Pencils—

Faber's Carpenters'	high list 50¢
Faber's Round Gilt	doz \$5.25
Dixon's Lead	doz \$4.50
Dixon's Lumber	doz \$6.75
Dixon's Carpenters'	40¢10¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00;	
6 to 7, \$13.00	60¢ @ 60¢10¢

Picture Nails—

Brass Head, Sargent's list	50¢10¢10¢
Brass Head, Combination list	50¢10¢
Porcelain Head, Sargent's list	50¢10¢10¢
Porcelain Head, Combination list	40¢10¢
Niles' Patent	40¢

Pinking Irons—

doz 65¢	
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Pipe, Wrought Iron—

List September 18, 1889	
1½ and under, Plain	50¢
1½ and under, Galvanized	42½¢
1½ and over, Plain	62½¢
1½ and over, Galvanized	50¢
Hotter Tube, Iron	
1½ and under	50¢
2 in. and larger	55¢

Planes and Plane Irons—

Wood Planes—	
Molding	50¢10¢25¢
Jench, First Quality	55¢10¢25¢
Bench, Second Quality	60¢10¢25¢
Butley's (Stanley R. & L. Co.)	40¢10¢

Iron Planes—	
Butley's (Stanley R. & L. Co.)	40¢10¢
Miscellaneous Planes (Stanley R. & L. Co.)	20¢10¢
Victor Planes (Stanley R. & L. Co.)	20¢10¢
Steel's Iron Planes	35¢@35¢5¢
Meriden Mfg. Iron Co.	30¢10¢30¢10¢10¢
Davis's Iron Planes	30¢10¢30¢10¢10¢

Birmingham Plane Co.	50¢@50¢5¢
Gage Tool Co.'s Self-Setting	20¢10¢
Chaplin's Iron Planes	40¢@40¢5¢
Sargent's	30¢10¢30¢10¢10¢

Plane Irons—

Plane Irons	20¢10¢
Plane Irons, Butcher's	\$5.00@5.25 to 5¢
Plane Irons, Buck Bros	30¢
Plane Irons, Auburn Tool Co., "Thistle"	35¢
Sandusky Tool Co.	30¢
Single and Cut	40¢
Double	40¢
L. & I. J. White	25¢

Pliers and Nippers—

Button's Patent	30¢10¢@40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	
\$21.00 doz	20¢10¢@35¢
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢5¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinner's Cutting Nippers	add 6¢ dis 10¢
Carew's Pat. Wire Cutters	20¢
Morrill's Parallel, doz, \$12.00	30¢5¢
Cronk's 8 in., \$15.00; 10 in., \$21.00	
	40¢@40¢5¢

Plumbs and Levels—

Regular List	70¢10¢@70¢10¢10¢
Disston's	45¢10¢
Pocket Levels	70¢10¢@70¢10¢10¢
Davis Iron Levels	30¢
Davis' Inclometers	10¢10¢

Polish, Metal.

Prestoline	20¢10¢
Prestoline Paste	35¢5¢
Gaston's Silver Compound	35¢5¢

Pokes, Animal—

Bishop's I. X. L.	doz \$6.50
Bishop's O. K.	doz \$5.50
Bishop's Pioneer	doz \$5.75
Bishop's American	doz \$3.00

Poppers, Corn—

Round or Square, 1 qt.	doz \$10.00@10.50
Round or Square, 1½ qt.	doz \$15.00@15.50
Round or Square, 3 qt.	doz \$18.50@19.00

Post Hole and Tree Augers

and Diggers—	
Samson Post Hole Digger	doz \$36.00

Fletcher Post Hole Augers	doz \$36, 20¢
Eureka Diggers	doz \$16.00@17.00
Lead's	doz \$8.00@9.00
Vaughan's Post Hole Auger	doz \$15.00

Kohler's Little Giant	doz \$18.00
Kohler's Hercules	doz \$18.00
Kohler's New Champion	doz \$9.00
Schneider	doz \$18.00
Ryan's Post Hole Diggers	doz \$24.00
Cronk's Post Bars	doz \$60.00

Gibbs Post Hole Digger	doz \$30.00, 50¢
Imperial	doz \$15.00

Potato Parers—

White Mountain	doz \$5.00@5.50
Antrim Combination	doz \$8.00
Hoosier	doz \$13.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and Saw	doz \$18.00, 20¢10¢
Disston's Pruning Hook	doz \$12.00, 20¢10¢
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat.	doz \$3.75
Henry's Pruning Shears	doz \$4.25@4.50 net

Wheelers, M. & C. Co.'s Combination,

Wheelers, M. & C. Co.'s Combination	doz \$12.00, 20¢
Dunlap's Saw and Chisel	doz \$8.50, 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

Pulleys—

Hot House, Awning, &c.	60¢10¢
Brass Screw	60¢10¢
Japaned Slide	60¢10¢
Japaned Clothes Line	60¢10¢
Empire Sash Pulley	55¢@60¢
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye, \$4.00; Swivel	\$4.50
Hay Fork, "Anti-Friction," 5 in. Solid	\$5.70

Hay Fork, "Common and Pat.	20¢
Bushed	20¢
Hay Fork, Tarbox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	40¢
Shade Rack	45¢
Tackle Blocks—See Blocks	
Moore's Anti-Friction 5 in. Wheel	doz \$12.00

Pumps—

Clatern, Best Makers	60¢@60¢10¢
Pitcher Spout, Best Makers	67¢@70¢
Pitcher Spout, Cheaper Goods	70¢@70¢5¢

Punches—

Saddlers' or Drive, good	doz, 60¢@65¢
Bemis & Call Co.'s Cast Steel Drive	50¢5¢
Bemis & Call Co.'s Springhead Socket	50¢5¢
Spring, good quality	doz \$2.50@2.60
Spring, Leach's Pat.	doz \$2.50@2.60
Bemis & Call Co.'s Spring and Check	40¢
Tinner's Hollow Punches	20¢25¢
Rice Hand Punches	15¢
Avery's Revolving	40¢
Avery's Saw-Set and Punch. See Saw Sets.	

Rail—

Sliding Door, Wrt Brass	doz 35¢
Sliding Door, Bronzed Wrt Iron	ft 7¢
Sliding Door, Iron, Painted	ft 4¢, 40¢
Barn Door, Light, 1 in.	doz \$2.00
B. D. for N. E. Hangers	small, Med. Large.
Per 100 feet	\$2.15 2.70 3.25, net

Terry's Steel Rail	doz foot
Victor Track Rail, 7½ ft foot	50¢25¢
Carrier Steel Rail	doz foot
Moore's Wrought Iron	20¢

Rakes—

Cast Steel, Association goods	70¢
Cast Steel, outside goods	60¢@70¢
Malleable	70¢@70¢5¢
Gibbs Lawn Rake	\$12.00, 50¢15¢
Canton Lawn Rake	\$0.00, 50¢10¢
St. Madison Prize Bow Rake and Peer-	2 100

Fort Madison Steel Tooth Lawn Rake,

\$6.00.	25¢
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Razors—

J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher, \$10.00 to 2	10¢
Jordan's AAA1, list Nov. 1, 1889	50¢
Jordan's Old Faithful, list Nov. 1, '89	50¢

Razor Straps—

Genuine Emerson	60¢@60¢5¢
Imitation	doz \$2.00, 20¢10¢5¢
Torrey's	20¢
Badger's Belt and Com	doz \$2.00
Lamont Combination	doz \$4.00
Jordan's Pat. Padded, list Nov. 1, '89	50¢

Rivets and Burrs—

Iron, list Nov. 17, '87	45¢
Copper	50¢10¢@60¢

Rivet Sets.

50¢10¢	
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Rods—

Stair, Brass	25¢2¢
Stair, Black Walnut	doz 40¢

Rollers—

Barn Door, Sargent's list	60¢10¢10¢
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢

Rope—

Manufacturers' prices for large lots:	
Manila, ½ in. and larger	doz 13½¢
Manila, ¾ in.	doz 13½¢
Manila, 1 in. and 5-16 in.	doz 14¢
Manila Tarred Rope	doz 12½¢
Manila Hay Rope	doz 13½¢
Sisal, ½ inch and larger	doz 11¢
Sisal, ¾ and 5-16 in.	doz 11½¢
Sisal, Hay Rope	doz 11¢
Sisal, Tarred Rope	doz 10½¢
Sisal, Medium Lathe Yarn	doz 10¢
Cotton Rope	doz 15¢@18¢ net
Jute Rope	doz 7½¢

Rules—

Boxwood	80¢10¢10¢@80¢10¢10¢5¢
Ivory	50¢50¢10¢
Starrett's Rules and Straight Edges	25¢10¢

Sand and Emery Paper and Cloth—

List April 19, 1888	50¢@50¢10¢
Sibley's Emery and Crocus Cloth	30¢

Sash Cord—

Common	doz 10¢@11¢
Patent, good quality	doz 13¢@13½¢
White Cotton Braided, fair	doz 25¢@26¢
Common Russia Sash	doz 13½¢
Patent	doz 15¢
Cable Laid Italian Sash	doz 22¢@23¢
Indicable Laid	doz 13¢

Silver Lake—

A Quality, White, 50¢	10¢10¢5¢
A Quality, Drab, 55¢	10¢10¢5¢
B Quality, White, 50¢	10¢10¢5¢
B Quality, Drab, 55¢	10¢10¢5¢
C Quality, White only	26¢@28¢
Sylvan Spring, Extra Braided, White, 34¢	
Sylvan Spring, Extra Braided, Drab, 36¢	
Semper Idem, Braided, White	30¢
Egyptian, India Hemp, Braided	25¢
Samson	

Sash Locks—

Clark's, No. 1, \$10; No. 2, \$8 gr.	33½¢
Ferguson's	33½¢
Morris and Triumph, list Aug. 16, 1886	40¢25¢

Sash Cord—	
Common.....	7 D, 10@11¢
Patent, good quality.....	7 D 13@13½¢
White Cotton Braided, fair..	7 28@29¢
Common, Rural, Sash	

Machine-	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand-	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	20¢ doz 2.25
Bench, Wood, Hickory.....	20¢ doz 10¢
Hand, Wood.....	25¢10¢25¢10¢55¢
Lag, Blunt Point, according to size.....	75¢10¢80¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢55¢
Hand Rail, Sargent's.....	60¢55¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls List.....	50¢50¢55¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢60¢10¢55¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws-	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	\$15
Barnes' Scroll Saw Blades.....	35¢
Sewing Machines-	
American (Cast) Iron.....	75¢10¢75¢10¢55¢
Pruning.....	See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....	20¢ doz 3.75
Timers.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢55¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢55¢
Heinrich's Tailor's Shears.....	33¢55¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢10¢
Clippers.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢55¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	70¢
Clauss Shear Co., Japaned.....	60¢
Clauss Shear Co., Nickelled, same list.....	60¢
Sheaves-	
Sliding Door-	
M. W. Co., list July, 1888.....	50¢10¢60¢55¢
R. & E., list Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction.....	60¢25¢
1885.....	60¢25¢
Moore's Anti-Friction.....	50¢
Sliding Shutter-	
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools-	
L. & J. White.....	20¢55¢
Albertson Mfg. Co.....	25¢
Shoes, orse, Mule, &c.-	
Horse-	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule-	
Add \$1 keg to above prices.....	
Or, Wrought-	
Ton lots.....	20¢ 9¢
1000 lb lots.....	20¢ 9¢
500 lb lots.....	20¢ 10¢
Shot-	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 25 bag, 25 lb.....	\$1.21
Drop, 25 bag, 5 lb.....	30¢
Buck and Chilled, 25 lb bag.....	1.46
Buck and Chilled, 5 lb bag.....	.35
Shovels and Spades-	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
Note: Jobbers frequently give 5¢ to 75¢ extra on above.....	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢60¢10¢
Griffith's Solid C. S. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.) 35¢	
St. Louis Shovel Co.....	20¢20¢75¢
Hussey, Blinn & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Pettibone & Son, list January, 1886.....	20¢
Remington's (Lowman's Pat.) 30¢10¢40¢	
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢55¢60¢10¢
Shovels and Tongs-	
Iron Head.....	60¢10¢60¢10¢55¢
Brass Head.....	60¢10¢10¢
Skins, Thimble-	
Western list.....	75¢55¢75¢10¢
Columbus Wrt. Steel, list Jan. 3, 1889.....	45¢10¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. & T. Skelns.....	60¢
Utica Turned and Fitted.....	35¢
Sieves-	
Buffalo Metallic, S. S. & Co.....	50¢25¢
Shaker (Barber's Pat.) Flour Sifters.....	20¢
Electric.....	20¢ doz \$2.00; 20¢ doz \$2.10
Hunter.....	20¢ doz \$2.00
Smith's Adjustable Sifters.....	20¢ doz \$2.00
Smith's Adjustable Milk Strainer.....	20¢ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	20¢ doz \$1.25
Sieves, Wooden Rim-	
Mesh 18, Nested, 20 doz.....	75¢ 95¢
Mesh 20, Nested, 20 doz.....	90¢ \$1.05
Mesh 24, Nested, 20 doz.....	\$1.10 1.20
Slates-	
School, by case.....	50¢50¢10¢
Staps, Harness, &c.-	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hutchins.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	60¢25¢
Covert.....	50¢55¢25¢
Covert, New Patent.....	60¢10¢25¢
Covert, New R. E.....	60¢10¢25¢
Covert Spring.....	60¢10¢10¢
Soldering Irons-	
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢

Spoke Shaves-	
Iron.....	45¢
Wood.....	40¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢20¢
Cincinnati.....	25¢10¢
Spoke Trimmers-	
Bonney's.....	20¢ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00 per doz.....	55¢10¢
Douglas.....	20¢ doz \$9.00, 20¢
Cincinnati.....	25¢
Spoons and Forks-	
Tinned Iron-	
Basting, Cen. Stamp. Co's list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co's list.....	70¢10¢
Buffalo S. S. & Co.....	35¢25¢
Silver Plated-(4 mos. or 5¢ cash 30 days.)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bros.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢55¢
Holmes & Edwards Silver Co.....	50¢10¢
L. Boardman & Son.....	50¢10¢
Miscellaneous-	
Holmes & Edwards Silver Co.....	50¢10¢55¢
No. 37 Mexican Silver.....	50¢10¢55¢
No. 30 Silver Metal.....	50¢10¢55¢
No. 24 German Silver.....	50¢10¢55¢
No. 50 Nickel Silver.....	50¢
No. 49 Nickel Silver.....	50¢10¢
German Silver.....	50¢60¢55¢
German Silver, Hall & Elton.....	50¢55¢ cash
Rock Silver.....	50¢55¢50¢10¢55¢
Britannia.....	60¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case lots.....	50¢
Springs-	
Elliptic, Concord, Platform and Half Spring.....	60¢60¢55¢
Cliff's Bolster Springs.....	25¢
Squares-	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	75¢ full cas. ex. 10¢
Try Square and T Bevels.....	60¢10¢60¢10¢
Disston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	40¢
Avery's Bevel Protractor.....	50¢
Standard Fibre Ware-	
Per Dozen.....	
Plain, Dec 7'd.....	\$2.00 \$2.25
Wash-Basins, 10 1/2 in.....	2.25 2.75
Wash-Basins, 12 in.....	2.25 2.75
Keelers, 1 1/4 in.....	4.00
Cuspidors.....	8.00
Spoonettes, "Daisy," 8 in.....	4.00 4.50
Peck Measure.....	4.00
Haycock Measure.....	3.50
See also Falls.....	
Staples-	
Fence Staples, Galvanized.....	Same price
Fence Staples, Plain.....	See Trl. Rep.
Steelyards-	
Blacksmith's.....	40¢10¢50¢
Stocks and Dies-	
Waterford Goods.....	30¢55¢30¢10¢
Butterfield's Goods.....	30¢55¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reese's New Screw Plates.....	35¢55¢40¢
Reversible Ratchet.....	30¢
Gardner.....	25¢
Stone-	
Hindostan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢.....	
Sand Stone.....	20¢ 25¢
Washita Stone, Extra.....	10¢10¢25¢
Washita Stone, No. 1.....	14¢15¢
Washita Stone, No. 2.....	10¢11¢
Washita Slips, No. 1, Extra.....	30¢35¢
Washita Slips, No. 1.....	24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	30¢
Turkey Slips.....	\$1.00 \$1.50
Lake Superior, Chase.....	10¢ 16¢
Lake Superior Slips, Chase.....	31¢32¢
Seneca Stone, Red Paper Brand.....	18¢20¢
Seneca Stone, High Rounds.....	20¢25¢
Seneca Stone, Small Whets.....	20¢25¢
Stove Polish-	
Joseph Dixon's.....	20¢ gro \$6.00, 10¢
Gold Medal.....	20¢ gro \$6.00, 25¢
Mirror.....	20¢ gro \$6.00, 25¢
Lustro.....	20¢ gro \$4.75
Ruby.....	20¢ gro \$3.75
Shining Sun, 5 gro lots.....	20¢ gro \$5.50
Dixon's Plumbago.....	20¢ \$6.00
Boynston's No. 1 Day.....	20¢ gro \$5.00
Parlor Pride Stove Enamel.....	20¢ gro \$5.00
Yates Liquid.....	20¢ 30¢ 10 gal.....
Yates Standard Paste Polish, 10 lb cans.....	12¢
Jet Black.....	20¢ 15¢
Japanese.....	20¢ gro \$3.50
Pirelsde.....	20¢ gro \$2.50
Diamond O. K. Enamel.....	20¢ gro \$19.00
Bonnell's Liquid Stove Polish.....	20¢ gro \$9.00
Bonnell's Paste Stove Polish.....	20¢ gro \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12¢
Black Jack Water Paste, 5 and 10 lb cans.....	12¢
Nickel Plate Paste.....	20¢ gro \$6.00
Tacks, Brads, &c.-	
List Oct. 19, 1889.....	
American Carpet, Blue.....	72¢10¢25¢
American Carpet, Tinned and Cop. pered.....	75¢10¢25¢
Steel Carpet, Bright & Blue.....	72¢10¢25¢
Steel Carpet, Tinned and Coppered.....	75¢10¢25¢
Swedes Iron Carpet, Blue.....	75¢10¢25¢
Swedes Iron Carpet, Tinned.....	77¢10¢25¢
Swedes Iron, S. S., Blue.....	72¢10¢25¢
Swedes Iron, S. S., Tinned.....	75¢10¢25¢
Swedes Iron, Lanc., Blue.....	67¢10¢25¢
Swedes Iron, Lanc., Tinned.....	72¢10¢25¢
Gimp and Lace, S. S., Blue.....	72¢10¢25¢
Gimp and Lace, S. S., Tinned.....	77¢10¢25¢
Gimp and Lace, Lanc., Blue.....	67¢10¢25¢
Gimp and Lace, Lanc., Tinned.....	72¢10¢25¢
Basket and Trimmers, Lanc.....	65¢10¢25¢
Hungarian Nails.....	70¢10¢25¢
Miners', S. S.....	75¢10¢25¢

Miners', Lanc.....	70¢10¢25¢
Common and Patent Brads.....	70¢10¢25¢
Leathered.....	40¢10¢25¢
Brush.....	50¢10¢25¢
Looking Glass.....	50¢10¢25¢
Picture-Frame Points.....	50¢10¢25¢
Copper.....	55¢10¢25¢
Carpet, Blue, by the count.....	75¢10¢25¢
Carpet, Tind, by the count.....	75¢10¢25¢
Found or by B. Papers or Bule.....	75¢10¢25¢
Swedes Iron, Lanc., Blue.....	67¢10¢25¢
Swedes Iron, Lanc., Tinned.....	75¢10¢25¢
Swedes Iron, S. S., Blue.....	75¢10¢25¢
Swedes Iron, S. S., Tinned.....	77¢10¢25¢
Gimp and Lace, Lanc., Blue.....	67¢10¢25¢
Gimp and Lace, Lanc., Tind.....	75¢10¢25¢
Gimp and Lace, S. S., Blue.....	75¢10¢25¢
Gimp and Lace, S. S., Tinned.....	77¢10¢25¢
Trimmers, Lanc.....	65¢10¢25¢
Basket, Lanc.....	65¢10¢25¢
Finishing Nails.....	67¢10¢25¢
Trunk and Clout Nails, Black or Cop. pered.....	70¢10¢25¢
Hungarian Nails.....	70¢10¢25¢
Black Nails.....	65¢10¢25¢
Chair Nails.....	65¢10¢25¢
Cigar Box Nails.....	65¢10¢25¢
Copper Trunk & Finsh. Nails.....	45¢10¢25¢
Zinc Glaziers Points.....	45¢10¢25¢
Miscellaneous-	
Double-Pointed.....	85¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wrg. Steel-Wire Brads, R. & E. Mfg. Co's list.....	50¢10¢
Tap Borers-	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	33¢55¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33¢55¢
Tapes, Measuring-	
American.....	33¢55¢33¢55¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers-	
Tin Case.....	80¢80¢10¢
Thimble Skelns-See Skelns.	
Ties, Bale-Steel	
Standard Wire, list.....	50¢10¢55¢
Tinners' Shears, &c.-	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢55¢
Tinware-	
Stamped, Japanned and Plated, list Jan. 20, 1887.....	75¢60¢75¢55¢
Tire Benders, Upsetters, &c-	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters-	
Champion.....	20¢10¢30¢
Wood Bottom.....	20¢ doz \$5.00, \$5.25
All Iron.....	20¢ doz \$4.25
Nashua Lock Co's.....	20¢ doz \$18.00 50¢55¢
Wilson's.....	55¢
Sargent's.....	20¢ doz \$24.55 10¢
Acme.....	20¢ doz \$20.00 40¢
Transom Lifters-	
Wollensack's:	
Class 3 and 4, Bronze Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Sky Light Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiber's, list Jan. 1, 1887.....	50¢
Bronzed Iron Rods.....	50¢10¢25¢
Brass, Real Bronze or Nickel Plate.....	30¢
Excelsior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps-	
Game-	
Newhouse.....	40¢40¢55¢
Oneda Pattern.....	70¢70¢10¢
Game, Blake's Patent.....	40¢10¢55¢
House and Rat-	
Mouse Wood Choker.....	20¢ doz holes, 11¢12¢
Mouse, Round Wire.....	20¢ doz \$1.50, 10¢
Mouse, Cage, Wire.....	20¢ doz \$2.50, 10¢
Mouse, Catch-em-alive.....	20¢ doz \$2.50, 15¢
Mouse, Bonanza.....	20¢ gr \$10.00
Mouse Delusion.....	20¢ gr \$15.00
Rat, Decoy.....	20¢ gr \$10.00, 10¢
Ideal.....	20¢ gr \$10.00
Cyclone.....	20¢ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	20¢ doz, 90¢; in full cases, 75¢
Hotchkiss Imp. Rat Killer.....	20¢ gr \$18.50
Hotchkiss New Rat Killer.....	20¢ gr \$16.50
Trowels-	
Lothrop's Brick and Plastering.....	25¢25¢55¢
Reed's Brick and Plastering.....	15¢
Disston's Brick and Plastering.....	25¢25¢10¢
Pease's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢20¢
Brad's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
Triers-	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.-	
B. & L. Block Co's list '82.....	40¢
Tubs, Boiler-	
See Pipe.....	
Twine-	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 20¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 30, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 36, 1/4 and 1/2 B Balls.....	11¢11¢14¢
Chalk Line, Cotton, 1/2 B Balls.....	25¢
Mason Line, Linen, 1/2 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1 B Balls.....	12¢12¢14¢
2-Ply Hemp, 1/4 and 1/2 B Balls.....	11¢11¢14¢
Cotton Wrapping, 5 Balls to lb.....	15¢10¢
2, 3, 4 and 5-Ply Jute, 1/2 B Balls.....	10¢
Wool.....	65¢60¢34¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	15¢

Vises-	
Solid Box.....	60¢60¢55¢
Parallel-	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	20¢20¢30¢
Parker's.....	20¢25¢
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Millers Falls.....	40¢10¢10¢
Trenton.....	40¢55¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	25¢25¢
Simpson's Adjustable.....	40¢
Moore's.....	20¢
Saw Filers-	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	33¢10¢33¢10¢10¢
Stearns's Silent Saw Vises.....	33¢25¢
Sargent's.....	60¢10¢
Hopkins.....	20¢ doz \$17.5

CURRENT METAL PRICES.

NOVEMBER 27, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
1 to 2 in. round and square.	per lb 2.00 @
1 to 6 in. x 3/4 to 1 in.	per lb 2.00 @
Refined Iron:	
1 to 2 in. round and square.	per lb 2.20 @
1 to 4 in. x 3/4 to 1 1/2 in.	per lb 2.20 @
4 1/2 to 6 in. x 3/4 to 1 in.	per lb 2.40 @
1 to 6 in. x 1 1/2 and 5-16	per lb 2.40 @
Rods—9 1/2 and 11-16 round and sq.	per lb 2.30 @
Bands—1 to 6 x 3-16 to No. 12.	per lb 2.50 @
"Burden Best" Iron, base price.	per lb 3.00 @
Burden's "H. B. & S." Iron, base price.	per lb 2.80 @
"Ulster"	per lb 3.00 @
Norway Rods	per lb 5.00 @

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 3/4¢
Best Cast Steel, base price in small lots	8¢
Best Cast Steel Machinery, base price in small lots.	5¢

Sheet Iron from Store.

Common American.	R. G. Cleaned.
10 to 16.	per lb 3.00 @ 3.00¢
17 to 20.	per lb 3.25 @ 3.25¢
21 to 24.	per lb 3.35 @ 3.35¢
25 and 26.	per lb 3.45 @ 3.75¢
27.	per lb 3.55 @ 4.00¢
28.	per lb 3.75 @ 4.25¢
B. B.	2d qual.
Galv'd, 14 to 20.	per lb 5.00 @ 4.75¢
Galv'd, 21 to 24.	per lb 5.37¢ @ 5.12¢
Galv'd, 25 to 26.	per lb 5.75 @ 5.50¢
Galv'd, 27.	per lb 6.12¢ @ 5.85¢
Galv'd, 28.	per lb 6.50 @ 6.23¢
Patent Planchet.	per lb 10¢ @ 9¢
Russia.	per lb 9 1/4¢ @ 10¢
American Cold Rolled B. B.	per lb 5¢ @ 7¢
Craig Polished Sheet Steel.	per lb 8 1/4¢

English Steel from Store.

Best Cast.	per lb 15¢
Extra Cast.	per lb 10 1/2¢
Swaged, Cast.	per lb 16¢
Best Double Shear.	per lb 15¢
Blister, 1st quality.	per lb 12¢
German Steel, Best.	per lb 10¢
3d quality.	per lb 9¢
3d quality.	per lb 8¢
Sheet Cast Steel, 1st quality.	per lb 15¢
2d quality.	per lb 14¢
3d quality.	per lb 12 1/2¢

METALS.

Tin.

Banca, Pigs.	per lb 23¢
Straits, Pigs.	per lb 23 1/4¢
English, Pigs.	per lb 23 1/4¢
Straits in Bars.	per lb 23 1/4¢

Tin Plates.

Charcoal Plates.—Bright.	Per box.
Melny Grade.	
IC, 10 x 14.	@ \$6.50
IC, 12 x 12.	@ 6.75
IC, 14 x 20.	@ 6.50
IC, 20 x 28.	@ 13.00
IX, 10 x 14.	@ 8.00
IX, 12 x 12.	@ 8.25
IX, 14 x 20.	@ 8.00
IX, 20 x 28.	@ 15.75
DC, 12 1/2 x 17.	@ 6.00
DX, 12 1/2 x 17.	@ 7.50
Caland Grade.	
IC, 10 x 14.	@ 6.50
IC, 12 x 12.	@ 6.75
IC, 14 x 20.	@ 6.40
IX, 10 x 14.	@ 7.65
IX, 12 x 12.	@ 7.90
IX, 14 x 20.	@ 7.65
Arlway Grade.	
IC, 10 x 14.	@ 5.60
IC, 12 x 12.	@ 5.75
IC, 14 x 20.	@ 5.60
IX, 10 x 14.	@ 11.00
IX, 12 x 12.	@ 6.75
IX, 14 x 20.	@ 6.90
IX, 20 x 28.	@ 6.75
IX, 20 x 28.	@ 13.50
DC, 12 1/2 x 17.	@ 5.30
DX, 12 1/2 x 17.	@ 6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.	@ \$5.12 1/2
10 x 20.	@ 7.25
20 x 28.	@ 10.25
IX, 10 x 14, 14 x 20.	@ 6.00
HV Grade.—IC, 10 x 14, 14 x 20.	@ 4.87 1/2

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20.	@ \$5.10
20 x 28.	@ 5.90
IX, 14 x 20.	@ 5.90
20 x 28.	@ 11.80
Abecarne Grade.—IC, 14 x 20.	@ 4.87 1/2
20 x 28.	@ 9.87 1/2
IX, 14 x 20.	@ 5.80
20 x 28.	@ 11.00

Tin Boiler Plates.

IXX, 14 x 26.	112 sheets. @ \$13.00 @ \$13.00
IXX, 14 x 28.	112 sheets. @ 13.25
IXX, 14 x 31.	112 sheets. @ 14.75

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 4 1/2¢ ad valorem.	
Ingot.	
Lake.	@ 13 1/4¢
Baltimore Grade.	@ 12 1/4¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound.							
			Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30—72	72	30	30	30	30	21	22	23	26	38
30—96	96	30	30	30	30	21	22	23	25	29
36—96	96	30	30	30	21	23	25	29	31	
48—96	96	30	30	23	25	27	31			
60—96	96	30	30	25	27	32				
60—96	96	30	31	28						
84—96	96	21	22							
84—96	96	22	23							
Over 84 in. wide		23	25							

All Bath Tub Sheets. 16 oz. 14 oz. 12 oz. 10 oz. Per pound. \$0.53 0.35 0.27 0.30
Bolt Copper, 3/4 inch diameter and over, per pound. 20¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	23¢
12 ounce and up to 14 ounce to square foot.....	24¢
10 ounce and up to 12 ounce.....	26¢
Circles less than 8 inches diameter 2 cents per pound additional.	
Circles over 13 inches diameter are not classed as Copper Bottoms.	

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.	8¢
Tinning sheets on one side, 30 x 60 each.	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each.	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each.	12¢
Tinning sheets on one side, other sizes, per square foot.	21¢
For tinning both sides double the above prices.	

Planchet Brass and Copper.

14 x 48.	By the case. 30¢
12 oz. and lighter.	By the case. 32¢
24 x 48 and 30 x 60.	
14 and 16 oz. and heavier.	44¢. 12 oz. 37¢

Seamless Brass and Copper Tubes.

O. G.	N. G.	3/4	1/2	3/8	1/4	1/8	1/16
8-14	6-12	35	31	28	27	26	25
15	13	36	31	29	28	27	26
16	14	37	32	30	29	28	27
17	15	38	33	31	30	29	28
18	16	40	34	32	30	29	28
19	17	41	35	33	32	31	30
20	18-19	42	37	35	34	33	32
21	20	44	39	37	36	35	34
22	21	46	40	38	37	36	35
23	22	48	42	40	39	38	37
24	23	51	44	42	41	39	38
25	24	54	47	44	43	42	41

Copper, Bronze and Gliding Tube, 2¢ per lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive.	35¢
Plain, above 3 inch.	45¢
Plain, 5-16 inch.	45¢
Plain, 1/4 inch.	60¢
Plain, 3-16 inch.	\$1.00
Plain, 1/2 inch.	1.50
Fancy Tubing, Brass to No. 20, inclusive.	43¢
Brass Tubing, 3¢ per lb more than Brass.	
Discount from list.	25 @ 30 %

Roll and Sheet Brass.

Discount from list. 25 %

High Brass Rods.

Over 1 inch diameter.	27¢
1/4 inch to 1 inch diameter, both inclusive.	24¢
No. 8 and less than 1/4 inch diameter.	26¢
Smaller than No. 8.	30¢
Hexagon, Octagon and Square, 2¢ per lb advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, 1.50 per 100 lb.	
Western Spelter	6¢
"Bergenport"	8 1/4¢
"Bertha"	8¢

Zinc.

Duty: Sheet, 2 1/2¢ per lb.	
600 lb casks.	6 1/4¢
Per lb.	7 1/4¢

Lead.

Duty: Pig, 3¢ per 100 lb. Old Lead, 2¢ per lb. Pipe and Sheets, 3¢ per lb.	
American.	4 1/4¢
Newark.	4 1/4¢
Bar.	4 1/4¢
Pipe, subject to trade discount.	6¢
Tin-Lined Pipe, subject to trade discount.	15¢
Block Tin Pipes, subject to trade discount.	45¢
Sheet, subject to trade discount.	6 1/4¢

Solder.

1/2 @ 1/4 (Guaranteed).	14 1/4¢
Extra Wiping.	12 1/4¢
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.	

Antimony.

Cookson.	per lb 32¢
Hallett's.	21 1/4¢

Fittings.

Cast Iron Fittings, Black and Galvanized.	75¢
Cast Iron Fittings, Bushings & Plugs, 7.5 x 1.0 @ 7.5 x 1.0 x 5.	75¢
Cast Iron Fittings, Flanges.	75¢
Malleable Iron Bushings.	75¢
Malleable Iron Unions.	70¢
Malleable Iron American Unions.	55¢
Malleable Iron Unions, Keystone.	55¢
Wrought-Iron Nipples.	75¢
Wrought-Iron Couplings.	70¢
Wrought-Iron Long Screws.	70¢
Casing Fittings.	60¢
Malleable Iron Fittings.	40¢

Valves, Cocks, &c.

Iron Body Valves.	70¢
Throttle Valves, Iron Body.	70¢
All-Iron Valves.	65¢
Compression Gauge Cocks.	60¢
Mississippi Gauge Cocks.	60¢
Register Gauge Cocks.	65¢
Air Cocks and Radiator Air Cocks.	65¢
Steam Gauge Cocks.	60¢
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle.	65¢
Globe Oil Cups.	55¢
Common Lubricators.	65¢
Lubricators with Air Cocks.	65¢
Iron Body Lubricators.	60¢
Steam Whistles.	65¢
Whistle Valves.	65¢
Water Gauges.	65¢
Brass Expansion Joints.	55¢
Pump Valves.	23¢
Soldering Unions.	65¢
Soldering Nipples.	70¢
Brass Unions (Union Joints).	65¢
Radiator Nipples.	6¢
Fusible Plugs.	60¢
Oil Pumps.	55¢
Self-Acting Air Valves.	65¢
Vacuum Valves.	55¢
Steam Swing Joints.	55¢
Iron Strainers.	55¢
Jenkins' Iron Body Valves, except Gate Valves, 60 x 10.	60¢
Jenkins' All-Iron Valves, except Gate Valves.	60¢
Jenkins' Iron Body Gate Valves.	55¢
Jenkins' All-Iron Gate Valves.	55¢
Iron Cocks, all Iron.	65¢
Iron Cocks, with Brass Plugs.	65¢
Brass Globe, Angle and Cross Valves.	65¢
Brass Globe Valves, Finished.	45¢
Brass Globe and Angle Valves, hose outlet.	65¢
Brass Garden Hose Valves.	65¢
Brass Caps for Hose Valves.	60¢
Brass Horizontal, Vertical and Angle Check Valves.	65¢
Brass Safety Valves.	65¢
Brass Safety Valves, low pressure.	65¢
Brass Safety Valves, low pressure, with balance weight.	65¢
Brass Butterfly Valves.	55¢
Brass Throttle Valves.	55¢
Brass Radiator Valves.	55¢
Brass Radiator Valves, Jenkins'.	65¢
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves.	65¢
Brass Jenkins' Gate Valves.	50¢
Brass Steam Cocks.	60¢
Brass Gas, Meter and Union Meter Cocks.	60¢
Brass Fittings, Rough.	60¢
Brass Fittings, Finished.	25¢
Brass Bushings.	60¢

Plumbers' Brass Work.

Ground Key Work, Rough.	60¢
Ground Key Work, Finished.	55¢
Compression Work.	60¢
Compression Work, Grundy, Heavy Pattern.	55¢
Chal' Stays.	60¢
Be u Plugs.	60¢
SI L or Bath and Wash Tray Plugs.	60¢
Basin Clamps.	55¢

PAINTS, OILS AND COLORS.

Animal and Vegetable Oils.

Linseed, City, raw.	per gal 60 @ 62
" boiled.	63 @ 65
" Western, raw.	57 @ 58
Lard, City, Extra Winter.	54 @ 55
" " Prime, present make.	54 @ 55
" " Extra No. 1.	45 @ 48
" " No. 1.	38 @ 42
" " Western, prime.	54 @ 55
Cotton-seed, Crude, prime.	26 @ 27
" " off grades.	35 @ 36
" " Summer Yellow.	35 @ 36
" " off grades.	34 @ 35
Sperm, Crude.	60 @ 65
" Natural Spring.	60 @ 65
" Bleached Spring.	60 @ 65
" Natural Winter.	70 @ 78
" Bleached Winter.	81 @ 83
Whale, Crude.	60 @ 65
" Natural Winter.	46 @ 48
" Bleached Winter.	48 @ 50
" Extra Bleached.	51 @ 52
Sea Elephant, Bleached Winter.	58 @ 60
Menhaden, Crude, Sound.	22 @ 24
" Crude, Southern.	26 @ 27
" Light Pressed.	27 @ 29
" Bleached Winter.	32 @ 33
" Extra Bleached.	36 @ 38